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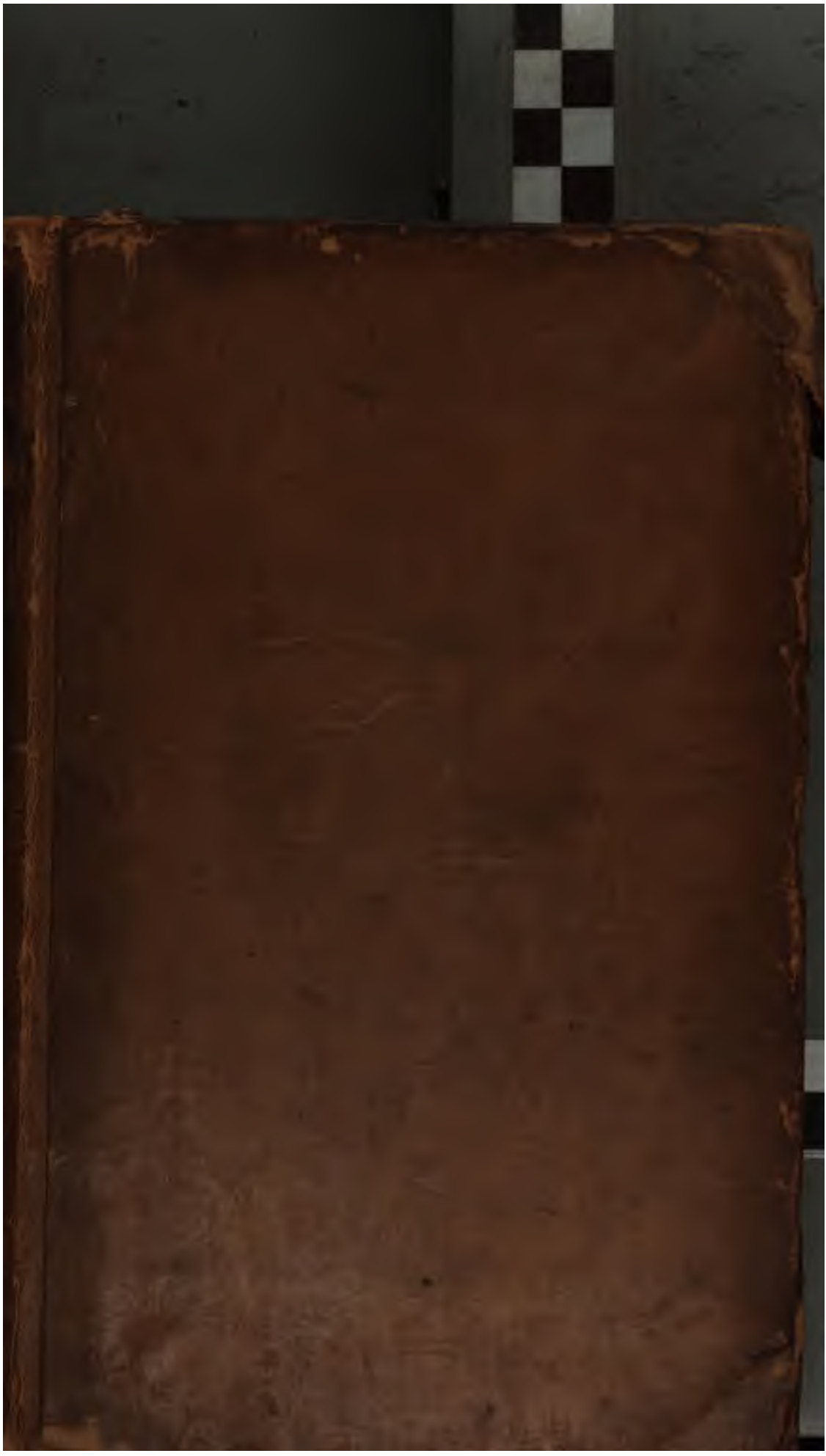
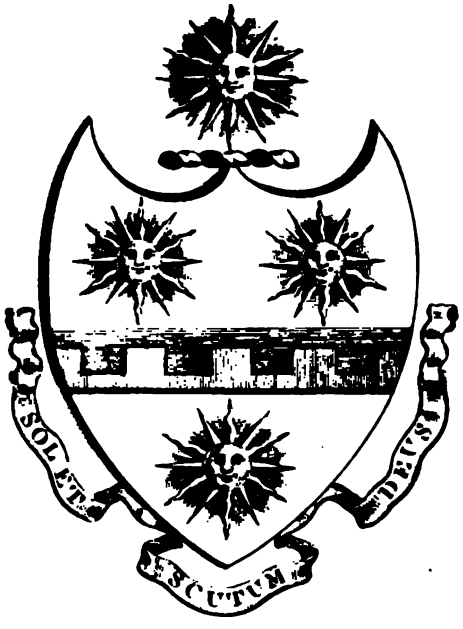




JOHN PEARSON

70. a. 8.

Mitford. 1845.

This Work referred to in a Treatise on Moral Freedom by W. Cairns. Lt. D. 1844. v. p. 333, 4. and elsewhere. as p. 493. The design of the Essays. is to show the want of constant conjunction between Motives and actions; and consequently to prove that the relation between them, is diff. from that between Physical Causes & effects. &c. — 494.

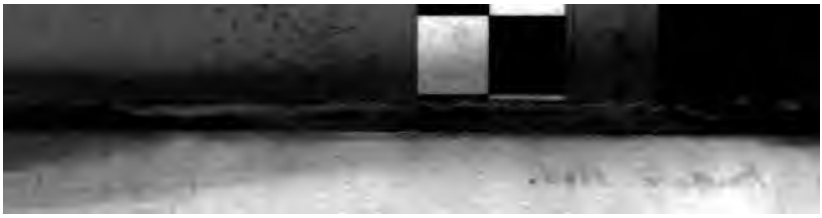
"The great point which Gregory maintains is, that the relation between Motives and Actions differs from that between Physical Causes & Effects, in the want of a constant conjunction. This he establishes by a multitude of examples, which will be found satisfactory. but he carries the reasoning to a length somewhat doubtful. by showing what a hard consequence would follow if such constant conjunction existed, & if Motives resembled physical Causes. In this reasoning here Stewart thinks there is a fallacy &c."

Cairns on Moral Freedom. p. 34

See Memoirs of Bentham. vol. 1. p. 215. Life of Fr. Horner. 1. p. 258.

See Parr's Spital Sermon on Dfrigory. p. 159. n

See Stewart's Dis. on the Active Powers. ii. p. 478.



See Monthly Review. 1797. (2) p. 10.

for

"Illustrations of Mr Hermes Essay concerning Liberty & Necessity, in answer to Dr Gregory of Edinburgh. 8vo pp 44."

See Rev. of these Essays in do. vol. IX. Dec. 1792. p 361.

PHILOSOPHICAL

AND

LITERARY

ESSAYS.

PHILOSOPHICAL

AND

LITERARY

ESSAYS.

BY

DR GREGORY, OF *EDINBURGH.*

VOL. I.

Nam Sophia ars illa eſt, quæ fallere ſuaviter horas
Admonet, atque orci non timuiſſe minas.
PSEUDON: apud PITCAIRN.

EDINBURGH:
SOLD BY T. CADELL, LONDON,
AND W. CREECH, EDINBURGH.
MDCCXCII.

BIBLIOTHECA

To Dr REID.

SIR,

IT would be ungrateful at leaſt, and almoſt uncandid, were I to publiſh theſe Eſſays, without inſcribing them to YOU; conſcious as I am, that, but for the aſſiſtance which I have received from your writings, they never could have been compoſed, nor thought of; and that, but for the approbation which many parts of them have met with from you, they never would have been publiſhed. Indeed the hint of the principal argument which I have endeavoured to ſtate and illuſtrate in the firſt of theſe Eſſays, the only one contained in this volume, was taken from an obſervation of yours, in one of your *Eſſays on*

the intellectual Powers of Man; the proſecution and application of which obſervation, I find, had not occurred to yourſelf.

I do not, however, preſume to publiſh my ſpeculations as wholly approved of by you; nor to make you in any degree anſwerable for ſuch parts of them as may be thought erroneous or doubtful. If they cannot anſwer for themſelves, it is I alone that muſt anſwer for them.

I have obſerved with much anxiety, that ſome of my obſervations and reaſonings, which to myſelf appeared juſt and important, have not appeared ſo to you; and, in conſequence of this diſtruſt or diſſent on your part, I have been led to examine with peculiar care, and to illuſtrate very fully, all thoſe ſuſpected parts of my diſquiſitions. The reſult of this more rigorous examination, in moſt inſtances, has been,

been, to confirm the opinion which I had formed before; and to enable me to illuſtrate it better, and to anſwer, in a manner which I think ſatisfactory, the principal objections that you had urged againſt my ſpeculations.

The difference of opinion between us, has, I think, been chiefly on certain points, which, from the nature of my inquiries, I have had occaſion to examine very minutely; much more ſo, I believe, than had ever been done before; and of which, though they had not altogether eſcaped your attention, you had taken only a more remote and general view. It is not for me, but for others, to judge, whether my attention to theſe points in ſcience has been ſucceſsfully employed or not.

I am too well acquainted with you, and with your candour in all matters of ſci-

ence, to ſuppoſe that any explanation or apology to you could be neceſſary for my conduct in this reſpect; or to think that you could have expected or wiſhed for any other conduct on my part. It is for the ſake of others, who might be ſtruck with certain differences of opinion between us, and who might miſtake them for an inconſiſtency with reſpect to thoſe important principles about which we perfectly agree, that I think it expedient to give ſome preliminary explanation and juſtification of my conduct. This I think I cannot better do than in the very words of BACON, whoſe ſentiments I am ſure you know, and revere, as much as I do: *Etſi non diſpliceat regula*, OPORTET DISCENTEM CREDERE; *huic tamen conjungendum eſt*, OPORTET JAM EDOCTUM JUDICIO SUO UTI; *diſcipuli enim debent magiſtris temporariam ſolum fidem, judiciique ſuſpenſionem, donec penitus imbiberint artes; non autem ple-*

nam

nam libertatis ejurationem, perpetuamque ingenii ſervitutem.

But though I take the liberty to differ materially from you on certain points in philoſophy, I embrace with joy this opportunity, the beſt or only I may ever have, of acknowledging what pleaſure and inſtruction I have derived from your converſation and writings; and of expreſſing the high ſenſe that I have of the merit of your philoſophy; which hath reſcued one of the nobleſt and moſt intereſting branches of knowledge, that of the Human Mind, from a ſtate that rendered it unworthy of the name of Science, and a reproach to the human underſtanding; an object of contempt to the Wiſe, of deteſtation to the Good, and of well-merited deriſion even to the Vulgar.

That ſyſtem of falſe ſcience, which you have ſo happily exploded, as dangerous to the

the beſt intereſts of mankind, has already undergone the ſevereſt reviſion and cenſure of ſome reſpectable authors, who, being themſelves warmly intereſted in the cauſe of religion and virtue, were diſpoſed to regard with the moſt jealous abhorrence every thing, and every word, that tended, however remotely, or threatened, however feebly, to ſhake their ſacred foundations.

But its baneful effects on ſcience itſelf have been greater and more evident; not merely by the many falſe and extravagant opinions to which it led, for theſe of themſelves muſt ſoon have died away, but by poiſoning the very fountain of knowledge; introducing the moſt viſionary principles as fundamental truths, with a perfect neglect and contempt of that patient impartial obſervation, and of that ſtrict and cautious induction, which alone can lead to the real knowledge of nature. It has thus

tended

tended rather to bewilder and darken mankind, than to lead and enlighten them in the paths of ſcience; and has too often made its votaries rather ingenious diſputants than ſolid reaſoners. Nor has it been leſs pernicious, by deterring the ableſt and moſt ardent in the purſuit of knowledge, with the unpromiſing appearance which it preſented, and the unſatisfactory attainments which it afforded; by ſatisfying the indolent with very imperfect and falſe accounts of thoſe vaſt regions of ſcience, which, by proper exertions of their own, they might well have hoped to explore; and by filling the vain, for even in ſcience vanity bears ſway, with an arrogant conceit of ſuperior knowledge, which they had neither talents nor perſeverance to attain.

I muſt ever be of opinion, that thoſe authors have deſerved well of mankind, who have contributed by their labours, either

either to make men wiſer, or to make them better; but they ſurely deſerve doubly well of them who do both. That ſuch is the happy ſpirit and tendency of your philoſophy, and that ſuch will be the influence of your writings on all who ſhall peruſe them with due attention, and without prejudice, I am well convinced. This proſpect, and the aſſurance that you do not labour in vain, while the pure ſunſhine of a well-ſpent life gilds the evening of your days, will, I hope, encourage you ſtill to proſecute thoſe inquiries, in which you have hitherto been ſo ſucceſsful.

Farewell.

JAMES GREGORY.

EDINBURGH,
JAN. 1.
1790.

INTRO-

INTRODUCTION.

IT muſt no doubt appear very ſtrange, and perhaps will be thought not very wiſe, for one, whoſe profeſſion and ſtation engage him in the cultivation of phyſical ſcience, ever to wander from his own more pleaſant and fruitful province, into the thorny and barren regions of metaphyſical ſpeculation.

Such a conduct it is perhaps impoſſible fully to juſtify, and it may be difficult even to excuſe; but in the preſent inſtance it may be, and it ſurely ought to be, accounted for at leaſt.

The treatiſe contained in this volume is part of a much more extenſive and important undertaking, *An Eſſay towards an inveſtigation of the exact import and extent of the common notion of the relation of Cauſe*

and Effect in phyſics, and of the real nature of that relation.

It will be admitted, I preſume, at once, that this is an important inquiry; and that it is a rational one too, if any means can be found whereby it may be proſecuted with certainty and with ſucceſs. From the nature and the object of it, it may be conceived to be equally intereſting to the Metaphyſician and to the Phyſical Inquirer; to the former, as relating to an eſſential part of the conſtitution of the human mind, or an important law of human thought; to the latter, as involving a ſtrict examination of that principle, which is the foundation of one great part of his ſcience: I mean that part of phyſical ſcience which is called Natural Philoſophy, in contradiſtinction to Natural Hiſtory.

The nature and objects of theſe two branches of Phyſical Science, and of courſe the proper diſtinction and boundary between them, I conceive to be ſufficiently and uniformly underſtood. Natural Hiſtory conſiders

conſiders material *Subſtances;* deſcribes them, gives them names, and arranges them, on the principle of reſemblance and difference, into higher and lower kinds and ſorts, or, in its own technical language, into Kingdoms, Claſſes, Orders, Genera, Species, and Varieties. Natural Philoſophy treats of phyſical *Events;* arranges them, in ſome meaſure, on the principle of reſemblance, but endeavours always to refer them to their reſpective cauſes. Hence the intimate connection of theſe two branches of Natural Science, and the immediate ſubſerviency of the former to the latter, muſt be evident, and are indeed univerſally acknowledged.

In every part of Natural Philoſophy, it is aſſumed as a principle, That no event or change (for all the events that we obſerve are changes only, we perceive not in any of them either the beginning or the end of exiſtence) comes to paſs merely of itſelf, that is, without relation to any thing elſe; but that every change ſtands related to, and implies the exiſtence and influence of, ſomething elſe, in conſe-

quence of which ſuch change came to paſs, and which may be regarded as the principle, beginning, or ſource, of the change referred to it. The term *Cauſe* is uſually employed to denote the ſuppoſed principle of change; and the term *Effect* is applied to the change conſidered as related to the principle of change whence it proceeded: for it muſt be obſerved, that both theſe terms, as commonly uſed, are relative. That which conſidered without relation to any change proceeding from it would be termed a Subſtance, or in ſome inſtances a Quality, or even an Event, when conſidered in that relation, is termed a *Cauſe*; and what conſidered as related to its cauſe would be termed an *Effect*, when regarded independently of that relation, is called an Event, or in ſome caſes a State, or a Quality: Juſt as a perſon who conſidered by himſelf is called a Man, when conſidered in different relations may be a father, a ſon, a brother, a huſband, a ſubject, a ſovereign, &c. Thus the melting of ſnow, conſidered ſimply, is an *Event*; as related to heat, it is an *Effect*: Heat we perceive only as a *Quality*; or we may

may call it perhaps a *State*; for aught we know, it may be a *Subſtance*, accumulated occaſionally in different bodies, like water in a ſponge: conſidered as related to the melting of ſnow, it is a *Cauſe*; conſidered as proceeding from the rays of the ſun, or the inflammation of fuel, &c. it is an *Effect*.

The general philoſophical principle on this point, involving the notion at preſent under conſideration, is commonly expreſſed in ſuch terms as the following: For every effect there muſt be a cauſe;—nothing exiſts, or nothing comes to paſs, without a cauſe;—*Nihil turpius philoſopho quam* FIERI *ſine cauſa quicquam dicere.*— And this principle, which is the foundation of Natural Philoſophy, has been regarded both as a phyſical and as a metaphyſical axiom; phyſical, as expreſſing an important general fact with reſpect to the material world; metaphyſical, as expreſſing a correſponding law of human thought, or ſomething which all men of competent judgement think, and cannot help thinking.

If

If this axiom were erroneous, Natural Philoſophy would be but a kind of dream; as Geometry would be, if the axioms of it were falſe; or as the ſyſtem of one would be, who ſhould hold that all animals are hatched from eggs, as birds are; or that every ſubſtance in nature is produced by generation, and has a father and a mother, as the more perfect animals have.

The axiom under conſideration cannot be ſuppoſed wholly erroneous; for every perſon of competent judgement and knowledge underſtands by it ſomething of which he has the moſt perfect and irreſiſtible conviction, as being univerſally true; and any perſon who ſhould preſume to deny it would be as little regarded, and would as little deſerve regard, as one who ſhould deny the axioms of geometry.

But though there may be *ſomething* in that axiom as unqueſtionably true as any axiom of geometry; yet it muſt be owned, that, taken altogether, it is not quite ſo clear and preciſe as might be wiſhed,

and

and as thoſe of geometry actually are; and therefore, however neceſſary it may be to admit the phyſical axiom of the univerſality and the neceſſity of a *Cauſe* for every *Event* or ſuppoſed *Effect*, it muſt be equally, and even previouſly, neceſſary to have it rendered clear and preciſe; which can be done only by a particular explanation, and full illuſtration of the notion expreſſed by the term *Cauſe*, and of the relation conceived to ſubſiſt between *Cauſe* and *Effect*.

It is in vain, and would be almoſt abſurd, to attempt to ſettle that preliminary point, by giving any *arbitrary* definitions, however clear and preciſe theſe might be made, of the notions and of the terms in queſtion. Such definitions may eaſily be given, and many different definitions of them have been given accordingly, both in ancient and modern times. All of theſe definitions of any one term or notion, ſuch as *Cauſe*, *may* be bad; that is, either altogether erroneous; or defective, and conſequently too general; or redundant, and conſequently too limited and partial, in their

their application: nay, all but one of them *muſt* be bad, foraſmuch as they are different.

It would require a diſſertation much longer than I ſhould wiſh this Introduction to be, to explain the laws of definition, with reſpect to natural objects, and to thoſe notions that are univerſal among mankind, and are the natural and ſpontaneous ſuggeſtions of the human faculties, and which may fairly be regarded as fundamental and indefeaſible laws in the conſtitution of the Human Mind.

It would even require a diſcuſſion inconveniently and diſproportionately long for this place, to point out all the improprieties, and all the pernicious conſequences, which have indeed been very extenſive and very permanent, of the arbitrary definitions and erroneous doctrines concerning cauſes, that make a fundamental part of the *Platonic* and *Ariſtotelian* philoſophy. Theſe perhaps are more ancient even than PLATO, and may have only been borrowed by him from ſome of his predeceſſors;

deceſſors; but they were fully adopted, and in ſome meaſure altered and modified, by his ſcholar ARISTOTLE; and by him were eſtabliſhed, as the very baſis of ſcience, for more than two thouſand years. The whole of that boaſted doctrine, impartially conſidered, may fairly be reſolved into one vague, confuſed, *unnatural* notion, (το ἐξ οὐ), which ſome philoſopher, in an evil hour for ſcience, had unluckily formed for himſelf, and contrived to expreſs by an arbitrary and bad definition of the Greek term αἰτια, which we tranſlate *Cauſe*. I call the definition and uſe of that term, by PLATO, and ARISTOTLE, and their followers, arbitrary and bad, not merely becauſe it is too vague and general, comprehending, for example, the matter, and the form, as well thoſe things uſually called and thought cauſes, and ſo is a violation of propriety of language, in Greek, as well as in Latin, and in the modern languages; but much more becauſe it is an attempt to do violence to the laws of human thought, and to make us conſider ſeveral *things* as *ſpecies* of one *genus*, among which things there is not in

reality a *generic* nature. It is an attempt to make a falſe and unnatural *genus*, which is indeed impracticable; but if it were poſſible, it would be a mortal ſin in the philoſophy as well as in the hiſtory of nature: it would be almoſt as bad as a falſe axiom. It is difficult to expreſs in common language the nature of the violence done, or rather attempted, to the indefeaſible laws of human thought, by ARISTOTLE's doctrine of Cauſes: the neareſt that I can come to a juſt expreſſion of it, is by obſerving, that it is a ſort of counterpart to an arbitrary and unnatural diviſion of a ſubject of thought. On ſuch an improper, or, as he calls it, inelegant diviſion, CICERO has very ſhrewdly remarked, *Hoc non eſt* DIVIDERE, *ſed* FRANGERE *rem:* of ARISTOTLE's doctrine of Cauſes, we may ſay, with equal truth, though not with equal wit, *Hoc non eſt* COMPREHENDERE, *ſed* CONFUNDERE *res.*—But as the minute diſcuſſion of that doctrine will come in more properly afterwards in the proſecution of theſe Eſſays, and is not immediately neceſſary for the underſtanding of any thing contained in this volume, I poſtpone

poſtpone it for the preſent; only obſerving, in the words of BACON, *Ut aqua non aſcendet altius quam caput fontis a quo promanat, ita doctrina ab* ARISTOTELE *deducta ſupra doctrinam* ARISTOTELIS *nunquam aſſurget.*

With reſpect to the other point, the exact import and extent of the common and natural notion of the relation of cauſe and effect, concerning which relation I conceive that various fanciful and erroneous opinions have been entertained, and of which notion many arbitrary and confuſed and falſe definitions have been given, I think it a moſt important and intereſting inquiry.

It is by no means neceſſary to examine minutely the various ſpeculations and definitions of different philoſophers about it; for that would be only to learn the opinions of a few individuals concerning a matter of fact, the truth of which is quite independent of them and their ſpeculations, and may be completely aſcertained without the ſmalleſt reference to

any thing which they have either written or thought. The knowledge of their ſpeculations about it muſt be conſidered chiefly as a matter of curioſity, and can ſcarce be thought of importance on any other account but with a view to the hiſtory of ſcience, as thoſe ſpeculations and notions of philoſophers, however fanciful, have had great influence on its progreſs.

But the queſtion concerning the natural and general notion of cauſe and effect is of the laſt importance; not that the circumſtances of its being natural or general can be regarded as any evidence of its being juſt and proper, nor that any appeal ſhould be made to vulgar opinions and prejudices, which have often been called Common Senſe, for the validity of that fundamental principle in ſcience; but that the preciſe import and extent of that notion being once aſcertained, it will be poſſible, which otherwiſe it would not be, to find out whether it be juſt and rational, or erroneous and groundleſs, or in what reſpects it is juſt, and in what erroneous;

neous; that is, in other words, to diſcover how far it coincides or is inconſiſtent with what we know of the eſtabliſhed laws and order of nature.

If we find, on careful examination, that there is among things and events a relation correſponding to our common notion of cauſe and effect, this notion, I think, may with ſufficient propriety be pronounced juſt and rational. But if there be in fact no ſuch relation among things and events, or if we can find no proof of there being ſuch an one among them, then I think our notion of the relation in queſtion muſt be pronounced either wholly or partly erroneous and groundleſs. If we find that there are among things and events ſeveral different relations, all of which have occaſionally been expreſſed by the terms *Cauſe* and *Effect*; that there are not only very different kinds of *Events* or *Effects*, (which indeed is ſelf-evident), but alſo different kinds of *Cauſes* or *Principles of Change*; and that between each of theſe and its correſponding event there is ſomething peculiar or ſpecific in the relation, beſides

beſides what is general or common in all ſuch relations; then I think it muſt be an important object in philoſophy to attend to all theſe different *Relations of Event*, to inveſtigate as far as poſſible the nature of every kind of Cauſe, to aſcertain the peculiar province of each, and to refer every kind of event or effect to its own proper cauſe or principle of change. And if we find that many events proceed from a concurrence or co-operation of two or more different kinds of cauſes, it muſt be the buſineſs of Philoſophy to aſcertain ſuch concurrence, and to diſcover what ſhare each kind of cauſe has in the production of thoſe phænomena which we obſerve and refer to them.

Many philoſophers have overlooked, what appears to me obvious to our unaſſiſted faculties, and generally acknowledged by mankind, and what I find on the moſt careful examination to be true, that there are many different relations, as well as different kinds of event, many different kinds of cauſes, and often the concurrence of ſeveral kinds of cauſes in the production

tion of one event. And ſuch philoſophers, in conſequence of their inattention to ſome of theſe obvious truths, and an ill-judged and ill-placed love of ſimplicity, and an eager deſire, to which we are by nature prone, of referring things to as few principles as poſſible, have ſometimes fallen into confuſion and error, even of the moſt extravagant kind, in their ſpeculations; by endeavouring to refer every kind of event or effect which they obſerved to one kind of cauſe. The kind of cauſe which has been thus favoured in preference to all others, and regarded as the only principle of change, has been different with different philoſophers, according to their ſeveral taſtes or fancies, and very much according to the kinds of event and cauſe which had chiefly engaged their attention. The inevitable conſequence of this conduct has been, to perplex this eſſential part of philoſophy, and to retard the progreſs both of phyſical and metaphyſical ſcience. And it is chiefly by following the very oppoſite conduct, that I think we may hope to acquire real and uſeful knowledge of the ſubject in queſtion; by attending

attending to thoſe differences, which have been ſo generally diſregarded among the ſeveral kinds of events, and of cauſes, and of relations of event and cauſe, and to the frequent co-operation of different kinds of cauſes; with a fixed diſtruſt of all the philoſophical notions and doctrines that have ever been inculcated on the ſubject; but with due regard to the natural ſuggeſtions of the human faculties, and a ſacred reverence to thoſe fundamental laws of human thought, according to which even our obſervations muſt be made, as well as our inferences drawn, and our ultimate opinions formed.

The expedient which I propoſe will not be thought unpromiſing, nor inadequate to the end in view, if it be conſidered, that it is chiefly or ſolely by the ſame kind of attention to reſemblances and differences among all the various tribes of objects which Nature preſents to us, without regard to authority or prejudices, but with due deference to the natural laws of thought, that we acquire all the knowledge that is competent to our faculties,

of

of thoſe objects, of their qualities, and of their relations. We know little, indeed, of what any thing is in itſelf; but much of what many things are with reſpect to one another, wherein they agree, wherein they differ, and how they ſtand related.

The ſimplicity and ſeeming obviouſneſs of the expedient may make it wonderful that it had not been employed long ago, but can be no objection to its uſe: on the contrary, ſhould be rather a recommendation of it. We have many inſtances, more important in themſelves, and more nearly akin to the ſubject in queſtion, than making an egg ſtand on its end, or breaking a bundle of rods, how effectually a purpoſe, ſeemingly difficult, if not impracticable, may be accompliſhed by means the ſimpleſt and moſt obvious, which in one point of view it appears ſtrange that any perſon ſhould have overlooked.

The vaſt fabric of natural ſcience, the glory of modern times, has all been rear-

ed by ſuch ſimple means; and the great merit of BACON was, that, in an age of darkneſs, and of prejudice worſe than ignorance, he had penetration to perceive, and judgement to value as they deſerved, and force of mind to recommend to others, thoſe ſimple but effectual means for the attainment of knowledge, which, now that we have been ſo long accuſtomed to ſee them ſucceſsfully employed, appear to us ſo natural and obvious, that we are apt to wonder, and even diſpoſed ſometimes to inquire philoſophically, how it came to paſs that they were ſo long, or that they were ever neglected.

That part of ſcience which I wiſh to explore is at preſent, in point of confuſion, and obſcurity, and prejudices, and dogmatical opinions repugnant to nature and to reaſon, in almoſt as bad a ſtate as the whole of Natural Philoſophy was two hundred years ago, before the genius of BACON began to enlighten the realms of Science; and the means which I propoſe to employ in the inveſtigation of it are preciſely thoſe which he recommends. As

it

it is difficult to do juſtice to his ſentiments in any language but his own, I quote his words :—*Nemo adhuc tanta mentis conſtantia et rigore inventus eſt, ut decreverit et ſibi impoſuerit, theorias et notiones communes penitus abolere, et intellectum abraſum et æquum ad particularia de integro applicare. Itaque illa ratio humana quam habemus, ex multa fide, et multo etiam caſu, nec non ex puerilibus, quas primo hauſimus, notionibus, farrago quædam eſt et congeries. Quod ſi quis ætate matura, et ſenſibus integris, et mente repurgata, ſe ad experientiam et particularia de integro applicet, de eo melius ſperandum eſt.—Neque quis nos vanitatis arguat, antequam exitum rei audiat, quæ ad exuendam omnem vanitatem ſpectat.—Si homines per tanta annorum ſpatia viam veram inveniendi et colendi ſcientias tenuiſſent, nec tamen ulterius progredi potuiſſent, audax procul dubio et temeraria foret opinio, poſſe rem in ulterius provehi. Quod ſi in via ipſa erratum ſit, atque hominum opera in iis conſumpta in quibus minime oportebat, ſequitur ex eo, non in rebus ipſis difficultatem oriri, quæ poteſtatis noſtræ non ſunt ; ſed in intellectu humano, ejuſque uſu et applicatione ; quæ*

res remedium et medicinam ſuſcipit. Itaque optimum fuerit illos ipſos errores proponere: quot enim fuerint errorum impedimenta in præterito, tot ſunt ſpei argumenta in futurum.

NOV. ORG. 97. 94.

It may be proper to mention, as there is ſome inaccuracy in the expreſſion of theſe important obſervations and precepts of BACON, that he muſt not be underſtood to mean, that we ought *completely* to aboliſh, and renounce *for ever*, *all* our common notions of things; nor indeed any of them, merely becauſe they are common, and original, and the natural ſuggeſtions of our faculties. Nor muſt it be thought that he required of us to endeavour to obtain, by means new and purely artificial, notions of things *totally* different from thoſe which generally prevail among mankind. Such an attempt would be impracticable, and therefore unreaſonable; but if it were practicable, it would be in the higheſt degree improper. The ſimple genuine ſuggeſtions of our natural faculties, or the notions which we acquire

acquire directly by the exercise of them, however imperfect, are, if not universally, at least very generally right; and they are indefeasible by any human power; as much as the laws of Matter and Motion are. But as they are very commonly imperfect, and as many great and valuable additions to them may be acquired by more accurate observation of the things to which they relate, it is necessary to be aware of the certain imperfection of many, and of the possible imperfection of all of them, and of course to be always ready to allow, on proper evidence, every just and authentic addition to be made to them.

Thus, for example, the common notions of Space, Time, Existence, Thought, Memory, Substance, Quality, Quantity, Equal, Greater, Less, and many other things, appear to be not only just, but nearly perfect; nor do I know of any important addition to them respectively that has been made by philosophy; and no man can abolish in himself those notions any more

more than he can alter his ſpecies, his ſex, or his ſtature.

The natural and common notions of Light, and Heat, and Air, and Water, of Seeing, and Hearing, and Breathing, appear to be juſt, ſo far as they go; but they are very limited and imperfect. What is natural in them, we cannot ſet aſide; nor ought we to wiſh to do it. But innumerable great and juſt additions have been made to thoſe notions, by means of accurate examination of the ſubjects to which they relate; as for example, the notions we have acquired by philoſophy concerning the compoſition, the refraction, the reflection, the motion, and the velocity of light; the weight, the ſpring, and the compoſition of the air; the compoſition of water; the ſtructure of the eye, and of the ear; the formation of an inverted image on the bottom of the eye; the tranſmiſſion of vibrations to the labyrinth of the ear; the function of reſpiration, the means by which it is performed, the ſubſerviency of it to life, &c. And no perſon of competent judgement can doubt,

doubt, that, as our knowledge of all theſe things is ſtill very imperfect, additions may be made to it by the acquiſition of new and juſt notions concerning them; without our ever having occaſion to aboliſh in ourſelves any the ſmalleſt part of thoſe notions which were the original and ſpontaneous ſuggeſtions of our faculties.

Some of our natural and moſt common notions appear to be erroneous; poſſibly in moſt caſes, from ſome raſh and falſe inference of our reaſon careleſsly employed, more than from any fallacy in our other faculties; as for example, the common notions of the flatneſs and ſtability of the earth, and of the diurnal motion of the ſun and of the ſtarry heavens. Of the ſame kind is the common notion with reſpect to body and motion, including the perſuaſion that motion, or every body put in motion, always tends to reſt. This wrong notion, which proceeds from our commonly obſerving motion that meets with reſiſtance, Philoſophy requires and enables us to correct, by making us obſerve

ſerve motion in various circumſtances, eſpecially in bodies that meet with little or no reſiſtance; by the aid of ſuch obſervations, and ſtrict reaſoning from them, we acquire a more juſt notion of the ſubject in queſtion, and conceive, that a body, once put at reſt, would for ever remain at reſt, or once put in motion, would for ever remain in uniform progreſſive rectilinear motion, if it were left abſolutely to itſelf.

But many more of our *common* notions are not purely genuine and natural, but partly ſuch, and partly the artificial productions of ingenious and ſpeculative men, who were eager to make authentic additions to their natural notions, or, in other words, to extend their knowledge of things, but unluckily miſtook the way to do it, and blended their own hypotheſes or conjectures with their juſt but very imperfect natural notions, and the inferences fairly deducible from theſe. Such conjectures are almoſt univerſally wrong, as experience has fully ſhewn; and, from the nature of our faculties, there is reaſon to think

think they ever muſt be ſo: but they are often pleaſing, like thoſe reveries or waking dreams which many perſons of warm imagination, and little vigour of mind, are fond to indulge, not merely to their authors, who commonly regard them with the partial affection of a parent; but to others to whom they are imparted, and who adopt with eagerneſs imaginary knowledge, that appears complete and important, and is eaſily and pleaſantly acquired. I apprehend it is chiefly ſuch theories or artificial notions that BACON requires us to aboliſh. They have been pretty effectually aboliſhed, for theſe hundred years, in moſt branches of natural philoſophy; thanks to his precepts and NEWTON's example: but in ſome parts of it, particularly in Medicine, they ſtill keep their ground; nor are they yet ſo completely baniſhed as might be wiſhed from the thoughts, and from the writings and ſyſtems, of many who endeavour to cultivate the philoſophy of the human mind.

Inſtances of this kind from medicine would be unintelligible, and perhaps diſ-

guſting, to thoſe who are not of the medical profeſſion, and probably diſagreeable and unſatisfactory to thoſe who are; for few, if any of us, have learned to conſider our own favourite ſpeculations as of the ſame kind, and the ſame value, with the ſyſtems of others, the imperfections of which even the dulleſt of us have penetration enough to diſcover.

In Metaphyſics, there has been a moſt illuſtrious example of an artificial hypothetical notion, ſo intimately blended with juſt and natural notions on the ſame ſubject, ſo generally admitted, unqueſtioned, in the reaſonings of philoſophers, and rendered ſo familiar to us by frequent repetition, and by the expreſſions of it being adopted in common language, that very few have been found of ſuch vigour and firmneſs of mind, that they either could or would lay it aſide; or diſtinguiſh between it and the natural notions with which it has been blended; or prevail on themſelves to examine the ſubject anew by careful obſervation and experiment, in order to acquire, if ſuch can be acquired, additional

additional authentic notions with reſpect to it.——I allude to the notion and the philoſophical theory of *Ideas*, or images of things, either in the mind, or at leaſt ſomehow preſented to it; which images, and not the real original things themſelves, have been by many philoſophers ſuppoſed to be the immediate or the only objects of thought in ſenſation, perception, memory, imagination, judgement, and indeed in every operation of mind, or modification of thought.

This doctrine of *ideas*, with all the ſyſtem of extravagant and ridiculous conſequences which are implied in it, and which have been moſt acutely deduced and gravely maintained by many diſtinguiſhed philoſophers, I conſider as one of the moſt ſplendid monuments that ever exiſted, or probably that ever will exiſt, of the abuſe and perverſion of human reaſon. But as it has been thoroughly examined and completely overturned by Dr Reid, I have no occaſion to conſider it minutely; and I allude to it at preſent only as a particular and very ſtriking illu-

ſtration of a general remark, which is indeed an important principle in the cultivation of ſcience.

Though the aſſumption of hypothetical principles of any kind, and the conſequent partial attachment to them, and neglect of accurate obſervation and experiment, and of ſtrict inductive reaſoning, be highly improper, both in phyſical and in metaphyſical reſearches; yet, on many accounts, they are more peculiarly pernicious, and quite inexcuſeable in the latter. Some of the principal reaſons of this difference I conceive it may be proper to mention particularly, and even to illuſtrate pretty fully: for though none of them, perhaps, have been altogether overlooked by men of ſcience; yet it is plain, that ſeveral of them have been very little attended to.

Every aſſumption or admiſſion of an hypotheſis, as a principle in ſcience, is to be regarded as a kind of anticipation of ſome new piece of knowledge, which, if aſcertained, would be a *Diſcovery*. Few indeed,

indeed, if any, diſcoveries have been made by means of hypotheſes; or, in other words, very few, if any hypotheſes, have been confirmed, in any branch of ſcience. But in phyſical ſcience, many curious and valuable diſcoveries have been made by other means, and are daily making, and I doubt not will continue to be made in it, as long as men ſhall continue to employ thoſe means which hitherto have been found ſucceſsful. But the caſe is widely different with reſpect to Metaphyſics, in which it appears to me, that no diſcoveries ever have been or ever can be made. This important difference reſults neceſſarily from the difference of the ſubject in phyſical and in metaphyſical inquiries. In the former, the ſubject is the events that occur in the material world, and the properties and the relations of every kind of body; which cannot be known to us directly or immediately by any kind of conſciouſneſs or intuition, but muſt be learned by careful obſervation and experiment, and ſtrict induction from theſe: in the latter, the ſubject is human thought, the laws of which, that is, the general facts or

principles

principles relating to which, it is the buſineſs of the Metaphyſician to explore accurately, and to deſcribe faithfully. But in them he can find nothing new or wonderful, either to himſelf or to others: nothing ſurely can be conceived more familiar, or better known to mankind, than their own thoughts. Any juſt account of them will appear at once to all men natural and true, as an accurate deſcription or a good picture of any familiar object would do: any falſe account of them will at once appear to all men ſtrange and wonderful, and will at once be rejected, or at leaſt greatly diſtruſted by them; juſt as a very bad deſcription of any familiar object, or a bad portrait of an intimate friend, would be. Even the more general facts with reſpect to human thought, which in one point of view may appear the moſt abſtruſe, as being the moſt uncommon ſubjects of converſation, or of diſtinct and ſeparate attention, will, on a cloſer inſpection, be found the moſt familiar of all, and the beſt known; they occur the moſt frequently; not indeed ſimply, but in combination with various particular

ticular thoughts in numberleſs inſtances. Nor is the want of appropriated words and phraſes in common language to expreſs them, and the conſequent difficulty and embarraſſment that we feel in treating of them ſcientifically, any proof of their not being familiar to us. The ſtructure of language, which all ordinary men learn ſufficiently and eaſily before they are five years of age, depends much more on the uniform and juſt conception of certain general laws of human thought, common to all mankind, than on the correſpondence of particular thoughts in different individuals. For all general words and phraſes, and all inflections, expreſs ſuch general conceptions, which are of many different kinds; while particular thoughts are expreſſed by proper names, which make but a very ſmall part of even the commoneſt language, ſuch as is uſed with perfect uniformity, and propriety, and good underſtanding, by the moſt ignorant and illiterate vulgar, nay, very often by young children, who are not only greatly deficient in knowledge, but far from having attained maturity of underſtanding.

Yet

Yet even ſuch language as they employ exhibits the reſult, and contains, or involves in its ſtructure, the evidence of much profound and ſolid metaphyſical knowledge, that is, knowledge of human thought, which, though common to all men, has very generally been neglected by thoſe who undertook to be their inſtructors.

No language can involve in its ſtructure any more metaphyſical knowledge than all men are capable of acquiring; for all men are by nature capable of learning, ſo as to underſtand and uſe properly, any common language: nor can any men underſtand, and uſe properly in ſpeech or writing, any language, unleſs they actually have acquired, and do poſſeſs, all that knowledge of human thought, both with reſpect to particular inſtances and more general laws or facts, which ſuch language by its ſtructure expreſſes; though they may find it difficult or impoſſible to deſcribe intelligibly, or to explain, or to expreſs by general and abſtract terms, any part of that knowledge. To ſuppoſe otherwiſe would be

be as unreaſonable and extravagant, as to ſuppoſe that men could give to every individual perſon his proper name, without any previous knowledge of it; or as it would be to ſuppoſe, that, without any previous knowledge of the different kinds and ſorts of natural objects, ſuch as animals, plants, or minerals, men could apply to all of them uniformly and properly their reſpective general names, in any, or in every language. Now, ſuch ſuppoſitions are repugnant, not only to matter of fact and uniform daily experience, but even to the very notion of language, and to the neceſſary relations between words and thoughts; they are not merely falſe, but abſurd; they are ſuch things as every perſon of ſound judgement muſt perceive intuitively, without any trial, to be impoſſible.

But though it be plain, that the ſtructure of language can expreſs nothing with reſpect to human thought but what men have known, and what all ordinary men are capable of underſtanding, and might, and probably would, have learned of themſelves,

themſelves, yet we muſt not ſuppoſe that the converſe of this propoſition holds true, and that nothing more has been thought by men, than what we find expreſſed or involved in the ſtructure of language; for example, that no other diſtinctions in point of thought have been made by men, than what they have words to expreſs. The truth is, that no language whatever is near ſo perfect, I mean ſo accurate, ſo diſtinct, and ſo varied, as human thought; nor can any language ever be made ſo: and different languages are in very different degrees of perfection, with reſpect not only to copiouſneſs, but to accuracy and diſtinctneſs in the expreſſion of thought.

It cannot reaſonably be doubted, that many men who have no uſe of artificial or grammatical language, I mean ſuch as are born deaf, and are conſequently dumb, and who have not been inſtructed in written language, have yet on other ſubjects, except language and ſounds, the ſame thoughts as other men have: for ſuch dumb perſons are not in general idiots; many

many of them, on the contrary, have ſhewn remarkable good ſenſe in their conduct, and even quickneſs and acuteneſs in the acquiſition of certain kinds of knowledge; which implies their perceiving and underſtanding the ſame things, and making the ſame diſtinctions that men do who have the uſe of language. Now, all men have numberleſs thoughts, both general and particular, which are no more expreſſed in language than the thoughts of dumb men are; and many others, which are expreſſed in language very imperfectly; ſometimes, for example, ſo obſcurely as not to be fully or clearly underſtood; ſometimes ſo ambiguouſly, that one thought ſhall be ſuggeſted when it is intended to convey another, or that different thoughts ſhall be unnaturally and unreaſonably blended together.

Theſe things have not been ſufficiently attended to by ſome philoſophers, who were ſenſible of the evidence which language afforded of the general laws of human thought, and who have endeavoured to avail themſelves of it in their reſearches.

Many inſtances might eaſily be given, and ſome I ſhall ſoon have occaſion to conſider, of very great errors proceeding from ſuch inattention to the imperfections of language; indeed every piece of falſe reaſoning, depending on the ambiguity of any word or phraſe, of which there have been many with reſpect to the philoſophy of cauſes, ſome of them ſo extravagant as to appear abſurd and ridiculous, may fairly be regarded as an example of an error proceeding from a haſty inference from the ſtructure of language.

Every ſuch error will have the appearance of a diſcovery in Metaphyſics, and will naturally attract the attention and excite the admiration of thoſe who know not the proper objects and the limits of this part of ſcience; while, on the contrary, no juſt account of any particular fact, or of any general law of human thought, and no inferences from ſuch laws, however acute and profound, and no application of them, however extenſive and important in explaining particular phœnomena, can have the charm of novelty,

velty, or the appearance of diſcovery. But every thing which has the appearance of diſcovery in Metaphyſics is to be diſtruſted on that very account; and it ought even to be rejected, as at leaſt an error in ſcience, if not an impoſition on mankind, unleſs it can be ſhewn, that it is no diſcovery, but ſuch a truth as every perſon will feel and recogniſe in himſelf by due attention to his own thoughts; and that it had the appearance of a diſcovery, only becauſe the ſubject of it had not before been attentively conſidered and properly expreſſed in words.

What ſome ancient philoſophers have whimſically and very erroneouſly aſſerted with reſpect to the learning of all ſcience, namely, that it is only a kind of reminiſcence of what we had known before, or, as they ſuppoſed, in a former ſtate, is almoſt literally true with reſpect to the ſcience of the human mind.

On this principle depends a curious and important difference in the way in which phyſical and metaphyſical ſcience may be taught.

taught. No part of the former can ever be taught, or produced in the learner, by putting queſtions to him, his anſwers to which ſhall almoſt certainly contain and expreſs the truth, both as to particular facts and general principles, with reſpect to the ſubject of inveſtigation; but every part of the latter, I believe, may be inveſtigated and communicated in that way. Of this we have a moſt beautiful ſpecimen in the *Memorabilia* of SOCRATES. The ſubjects of diſcuſſion in thoſe admirable dialogues all belong to the ſcience of mind; ſuch as, the principles of natural religion, of morality, of the œconomy of human life, of politics, &c.; and his peculiar mode of philoſophiſing ſecured to him all the advantages of the *inductive* mode of reaſoning; eſpecially due knowledge of the particular facts from which his general concluſions and principles were to be derived. This circumſtance of itſelf was ſufficient to give him an infinite ſuperiority over his cotemporary philoſophers, who, in their reſearches and reaſonings, proceeded on what may be called the *dogmatic* plan; beginning with vague, hypothetical,

hypothetical, and often erroneous principles, perhaps with arbitrary, and bad, and almoſt unintelligible definitions, and reaſoning ſtrictly, and often with admirable acuteneſs, from ſuch definitions and principles to concluſions which they were at no pains to verify as matters of fact, many of which were extravagantly falſe, and others ſo frivolous, that it was of no conſequence to mankind whether they were true or falſe.

What SOCRATES did in Ethics may be done by the ſame means in every branch of Metaphyſics; in the hiſtory of our various faculties of perception, memory, imagination, abſtraction, judgement, &c.; and in logic, grammar, (I mean the general principles of grammar, which are common to all languages, and not the particular rules of grammar that are peculiar to certain languages), rhetoric, poetry, and in general the principles of taſte and criticiſm; nay, even in thoſe ultimate principles of phyſical ſcience which I propoſe to conſider, and which have their foundation in the laws of human thought.

I do not mean to ſay, that every philoſopher, or that every pedant, who may fancy himſelf qualified for ſuch an undertaking, and ſhall chooſe to make the attempt, will ſucceed in it: I am well convinced, that not only much knowledge of the ſubject, but alſo uncommon ſtrength of underſtanding, and clearneſs of apprehenſion, and acuteneſs and quickneſs of judgement in perceiving relations and neceſſary conſequences, and great candour, both in point of freedom from prejudices and openneſs to conviction, and a ſuperiority to thoſe embarraſſments which proceed from the ambiguity and other imperfections of language, and, above all, a peculiar talent of communicating thought conciſely, clearly, and forcibly, are as neceſſary to enable men ſucceſsfully to cultivate and to impart knowledge in that way as in any other. I do not believe that one man in ten thouſand could have done what SOCRATES did in this way, even in Ethics; and I believe there are many thouſands of very honeſt and ſenſible men, who would find themſelves utterly unable to imitate his dialogues,

even

even on moral ſubjects, though with the advantage of his example as a model to regulate and direct their efforts. I only mean to ſay, that in the whole ſcience of mind, from the nature of the ſubject, and of the various phænomena which are to be conſidered, the Socratic method of inſtruction is rational and practicable; and that by men of real genius and knowledge, it may occaſionally be employed with ſucceſs.

But in phyſics the ſame mode of inſtruction is impracticable; and to attempt it would inſtantly appear abſurd. If the greateſt philoſopher in the world, and the beſt informed in all branches of phyſical ſcience, ſhould take it into his head to inſtruct the ignorant vulgar, by putting queſtions to them concerning the law of gravitation, and the motions of the planets, and the ebbing and flowing of the ſea, and the properties of light, and the weight and ſpring of the air, and the compoſition of air and of water, nay even concerning the ſtructure of their own ſtomachs, and eyes, and brains; what ſucceſs

could he ever meet with? What kind of anſwers could he be ſuppoſed to receive from thoſe whom he wiſhed to inſtruct? What would be thought of ſuch a philoſopher? To me it appears abundantly plain, that the very materials for philoſophiſing in that way on phyſical ſubjects are wanting; while on metaphyſical ſubjects they are plentifully preſent in the bulk of mankind.

Any perſon in the leaſt acquainted with the philoſophy and with the genius of SOCRATES, will know perfectly what he would have thought and ſaid of ſuch a mode of inſtructing men in phyſical ſcience. He would have told the philoſopher at once, that his undertaking was juſt like the attempt of a midwife to deliver a woman that was not with child.

It is nowiſe ſurpriſing, that the eager deſire and conſtant unavailing attempt to make diſcoveries in metaphyſics, ſhould have prevailed in ancient times, and among thoſe who cultivated the ſchool philoſophy, both before and after the revival of

of letters; for it is plain, that in thoſe times neither the proper method of philoſophiſing, nor even the very objects of philoſophy, were at all underſtood. It appears, I think beyond a doubt, that thoſe who were moſt eagerly engaged in the cultivation of different parts of ſcience, and who, from their talents and knowledge, had the faireſt proſpect of ſucceſs in their inquiries, did not know what were the limits of human knowledge, and of courſe were often moſt diligently employed in the purſuit of objects that were abſolutely unattainable: as, for example, when they attempted to reaſon *a priori* concerning either body or mind, from certain arbitrary principles, and imperfect, confuſed, or erroneous notions, not a jot the better for being expreſſed, as they often were, in the form of definitions; or when, inſtead of obſerving, comparing, and arranging particular facts or phænomena in any part of ſcience, and from them deducing the general principles or laws of that part of nature, they endeavoured to find out or explain, or, more properly ſpeaking, to *gueſs*, how thoſe phænomena were produced; or

when, adopting as a juſt philoſophical principle, that pleaſing, but very vague analogy, which all mankind have acknowledged, between mind and body, between things intellectual and things material, they endeavoured to explain ſome of the phænomena of human thought on phyſical principles, and many of the phænomena of the material world, eſpecially motion, on what may be called metaphyſical principles, or the ſuppoſed operation of mind.

That analogy between things intellectual and things material muſt no doubt be ſtriking; for all mankind have perceived it, and adopted it in the very firſt formation of their language: yet I believe the moſt acute and enlightened philoſophers would find it difficult in moſt caſes to trace it, or to ſpecify wherein it conſiſts; for ſurely no things can be conceived more completely different than the qualities of body and the modifications of thought. I ſhould think the nature of this ſingular and remote analogy, which cannot be altogether fanciful, might be a curious, and perhaps

perhaps an uſeful, ſubject of inveſtigation. But hitherto it has been only a plentiful and moſt pernicious ſource of confuſion and error, both in phyſics and in metaphyſics, and particularly of *diſcoveries* in the latter; all of which are errors. Poſſibly a fair and very ſtrict examination of that analogy, and the preciſe knowledge which may be thereby acquired of the differences, as well as of the reſemblances, of certain things which we are accuſtomed to blend in our thoughts, will be found the moſt effectual or the only way to eradicate ſome very erroneous principles, which have had a very extenſive and permanent influence in ſcience; and which, by being almoſt univerſal among mankind, and familiar to us from our earlieſt years, have often been regarded as unqueſtionable truths, and indefeaſible laws of human thought. Some attempts of this kind I have had occaſion to make in the courſe of my inquiries: with what ſucceſs the reader muſt judge.

But though it was natural for philoſophers, who had but very imperfect and erroneous

erroneous notions of the proper objects and proper method of ſcientific inveſtigation, to endeavour to make diſcoveries in metaphyſics; yet it is very remarkable, and not eaſily to be accounted for in a ſatisfactory manner, that long after the precepts of BACON were generally known, and even after the example of NEWTON had fully explained thoſe precepts, and had ſhewn how juſt and important they were, almoſt every Metaphyſician would ſtill perſiſt in making diſcoveries in his ſcience. LEIBNITZ, though a man of uncommon talents and very extenſive knowledge, and an excellent mathematician, and well verſed in phyſical ſcience, was unluckily a great diſcoverer in metaphyſics; and he ſucceeded accordingly. MR LOCKE, who was certainly a man of ſtrong and ſound judgement on almoſt every ſubject, and a great and original genius in this branch of ſcience, had the ſame unfortunate attachment to diſcoveries in metaphyſics; eſpecially on the principle of the doctrine of Ideas. This fruſtrated completely much of his labour, and in ſome meaſure weakened and corrupted his whole

whole ſyſtem of philoſophy. There was a time when the metaphyſical doctrine, that heat, and cold, and colour, and other ſecondary qualities of body, were only ideas of the human mind, and no qualities of bodies, was regarded as a diſcovery as real, and perhaps an addition to ſcience as important, as NEWTON's inveſtigation of the law of gravity, and of the motion and compoſition of light. BERKELEY and HUME followed the ſame plan of diſcovery in metaphyſics with ſtill greater diligence, and proportionable ſucceſs. DR PRIESTLY, and many others of leſs note, have followed nearly the ſame plan; ſometimes adopting and maintaining with eagerneſs the diſcoveries of their great predeceſſors, ſometimes favouring the world with further diſcoveries of their own, preciſely of the ſame value with thoſe that went before them.

Let it be remembered, however, for the honour of human reaſon, that before DR PRIESTLY had begun his diſcoveries in metaphyſics, and before DR REID had expoſed to deſerved contempt the diſcoveries

ries of preceding Metaphyſicians, there had been at leaſt one author who had ſo much good ſenſe, and ſuch juſt notions of ſcience, as to perceive and to explain clearly the futility of ſuch diſcoveries. I mean Monſ. D'ALEMBERT; whoſe words I quote.

On peut dire en un ſens de la Metaphyſique, que tout le monde la ſait ou perſonne, ou pour parler plus exactement, que tout le monde ignore celle que tout le monde ne peut ſavoir. Il en eſt des Ouvrages de ce genre comme des Pieces de Theatre; l'impreſſion eſt manquée quand elle n'eſt pas generale. Le vrai en Metaphyſique reſſemble au vrai en matiere de Gout; c'eſt un vrai dont tous les eſprits ont le germe en eux memes, auquel la plupart ne font point d'attention, mais qu'ils reconnoiſſent des qu'on le leur montre. Il ſemble que tout ce qu'on apprend dans un bon Livre de Metaphyſique, ne ſoit qu'une eſpece de reminiſcence de ce que notre ame a deja ſu; l'obſcurité, quand il y en a, vient toujours de la faute de l'Auteur, parce que la Science qu'il ſe propoſe d'enſeigner n'a point d'autre langue que la langue commune. Auſſi peut-on appliquer aux

aux bons Auteurs de Metaphyſique ce qu'on a dit des bons Ecrivains, qu'il n'y a perſonne qui en les liſant, ne croie pouvoir en dire autant qu'eux.

Mais ſi dans ce genre tous ſont faits pour entendre, tous ne ſont pas faits pour inſtruire. Le mérite de faire entrer avec facilité dans les eſprits des notions vraies et ſimples, eſt beaucoup plus grand qu'on ne penſe, puiſque l'experience nous prouve combien il eſt rare; les ſaines idees metaphyſiques ſont des vérités communes, que chacun ſaiſit, mais que peu d'hommes ont le talent de developper; tant il eſt difficile, dans quelque ſujet que ce puiſſe etre, de ſe rendre propre ce qui appartient a tout le monde. Je ne crains point que ces reflexions bleſſent nos Metaphyſiciens modernes; ceux qui n'en ſont pas l'objeƈt y applaudiront, ceux qui pourròient l'etre croiront qu'elles ne les regardent pas; mais les Lecteurs ſauront bien diſtinguer les uns des autres.

MELANGES, *vol.* 4. *art.* VI. *p.* 45.

Theſe obſervàtions of M. D'ALEMBERT appear to me unqueſtionably juſt, and

highly important: indeed I know of no author who ſeems to have had a clearer or better notion of the nature and proper objects of metaphyſical reſearches, and of the real value of them, than he had. I have had occaſion accidentally to learn, that D'ALEMBERT continued of the ſame opinion long after DR PRIESTLY's metaphyſical diſcoveries were publiſhed to the world; and that he expreſſed the ſame ſentiments very happily, and in a manner truly laconic, for it was in one word, a ſhort time before his death.

A friend of mine, a gentleman well known in the literary world, happening to be at Paris in 1783, had the honour of being introduced to D'ALEMBERT. The converſation naturally turning on Engliſh literature and ſcience, the name of DR PRIESTLY was mentioned of courſe: one of the company (not my friend) obſerved, *C'eſt un Homme qui a fait de grandes Decouvertes dans la Phyſique et dans la Metaphyſique.*——

D'ALEMBERT. *Decouvertes dans la Metaphyſique!* DIABLE!

Now,

Now, this apophthegm cannot be properly tranſlated: for the ſimple word *Diable*, pronounced with the proper emphaſis, (which I am well aſſured it was at that time), expreſſes with mathematical preciſion, worthy of D'ALEMBERT, the full value of all the diſcoveries that ever were or ever will be made in Metaphyſics; DR PRIESTLY's included.——I believe, indeed, DR PRIESTLY has carried the joke a good deal further, and has for ſome years paſt been diligently employed in making diſcoveries in Theology. This I, who am no Theologian, and have not the ſmalleſt ambition to become one, ſhould have been very apt to pronounce, *Nihil aliud agere, quam ſi des operam ut cum ratione inſanias:* but I underſtand that he has been wonderfully ſucceſsful in his theological diſcoveries; and that he has actually made more ſuch diſcoveries already, to his own ſhare, than all the Biſhops and all the Doctors of Divinity of the two Univerſities in England have done ſince the Reformation; which is certainly great encouragement. For, at this rate, we may reaſonably expect to have, in two or three years, a

complete new ſyſtem of Theology, as different from the old as the philoſophy of NEWTON is from that of ARISTOTLE; but whether it will be as great and as uſeful an addition to human knowledge, I think may reaſonably be doubted. D'ALEMBERT, who, though no Theologian, was a man of excellent underſtanding, and very extenſive knowledge, ſeems to have placed diſcoveries in Theology in the ſame category with thoſe in Metaphyſics.

Il n'y a proprement que trois genres de Connoiſſances ou les decouvertes n'aient pas lieu; l'Erudition, parce que les faits ne ſe devinent, et ne s'inventent pas; la Metaphyſique, parce que les faits ſe trouvent au dedans de nous-memes; la Theologie, parce que le depot de la Foi eſt inalterable, et qu'il ne ſauroit y avoir de Revelation nouvelle.

MELANGES, *vol.* 4. *p.* 292.

It is very unfortunate, that out of only three ſubjects in which diſcoveries cannot be made, DR PRIESTLY ſhould have pitched

pitched on two, in which he will inſiſt on making diſcoveries.

As I have not the honour of being perſonally acquainted with DR PRIESTLY, I cannot judge with certainty, whether it will be poſſible to explain to him properly, ſo as to make him fully underſtand, theſe obſervations which I have quoted from Monſ. D'ALEMBERT: but from what I know of him by his writings, and by ſome little correſpondence that I have lately had with him on the ſubject of one of my Eſſays, I can eaſily perceive, that ſuch an undertaking, if it be at all practicable, muſt be a work of infinite labour and difficulty, and will probably meet with very obſtinate reſiſtance on his part; nor can it reaſonably be doubted, that, if it were at laſt, by the perſevering efforts of his friends, happily accompliſhed, he would inſtantly exclaim, as the philoſopher of *Argos*, ſo honourably mentioned by HORACE, did on a ſimilar occaſion, *Pol, me occidiſtis amici, non ſervâſtis; cui ſic extorta voluptas, et demptus per vim mentis gratiſſimus error.* Nevertheleſs, I hope ſome of his

his friends will fairly make the trial, and that they will not be eaſily diſcouraged; for if DR PRIESTLY could by any means be made to underſtand thoſe important remarks of the French philoſopher, it would be impoſſible for him to diſſent from them; the ſcales would inſtantly fall from his eyes, and he would be *ipſo facto* cured of that unhappy diſeaſe of making diſcoveries in Metaphyſics and in Theology; which is a conſummation for many reaſons devoutly to be wiſhed.

But though I conceive that no diſcoveries can be made in metaphyſics, and that all philoſophers who cultivate this part of ſcience ought always to diſtruſt and to avoid every thing which has the appearance of diſcovery in it, it is not my intention to depreciate the whole or any part of the philoſophy of the human mind, nor to repreſent it as either inſcrutable in itſelf, or as unattainable by us, and placed by Nature beyond the reach of our faculties. I acknowledge it to be not only a pleaſing, but an intereſting, and, in many reſpects, a very uſeful branch of ſcience.

I acknowledge that conſiderable progreſs has been made in the cultivation of ſeveral parts of it, by many different philoſophers. I can have no doubt, that much greater progreſs will yet be made in it by thoſe who ſhall cultivate it in a proper manner, on juſt principles, and, above all, with juſt notions of the objects and the limits of it. I regret that ſo much bad reaſoning and imaginary knowledge, and ſo many pretended diſcoveries in this part of ſcience, have, during many ages, been ſucceſſively obtruded on the world; for this has not only corrupted the ſcience, and retarded its progreſs, but almoſt brought it into general contempt. The very name of it, which, to ſay the truth, is of itſelf almoſt ridiculous, and was given originally by mere accident to certain lucubrations of ARISTOTLE, is very commonly regarded and employed as a term of contempt and reproach.

Thoſe lucubrations of ARISTOTLE, which, in conſequence of their having been compoſed or publiſhed after his books on phyſics, got the title of Metaphyſics,

phyſics, are of as little value as his phyſics; and worſe can ſcarce be ſaid of them. A great part of them, indeed, differs very little from the doctrines comprehended under the title of Phyſics in the works of ARISTOTLE; ſo very little indeed, that I am confident many perſons, both good ſcholars, and men of ſcience, might read whole pages ſelected promiſcuouſly from his phyſics and his metaphyſics, without knowing, or thinking it worth their while to inquire, which was which.

But the term *Metaphyſics* has long been employed and underſtood to denote thoſe parts of ſcience whereof the ſubject is the human mind, and its various operations, or, in other words, all modifications of thought, in contradiſtinction to phyſics, whereof the ſubject is body, and the various changes that occur in it. A rational hiſtory of the various operations of thought, a natural and good arrangement of them, an accurate examination and compariſon of them, ſo as to aſcertain their various relations, and wherein they agree and wherein they differ, are ſurely things

things attainable, and perfectly within the reach of our faculties. The reſult of ſuch an inveſtigation will be, if not the diſcovery, at leaſt the more diſtinct and more perfect knowledge, and the firm eſtabliſhment, of certain general principles; and ultimately a ſyſtem of ſcience will be formed, bearing that relation to the particular phænomena of mind, which phyſical ſcience bears to the phænomena of body.

From the avidity with which many pieces of falſe metaphyſical ſcience have been ſtudied and adopted, and from the pleaſure and exultation which many philoſophers appear to have felt in the acquiſition of ſuch imaginary knowledge, we may judge how great and permanent a gratification men may derive from the attainment of real knowledge in this part of philoſophy. The caſe is preciſely parallel to what took place for many ages with reſpect to phyſical ſcience, which ſtill had charms to engage the attention of philoſophers, and to excite the admiration of others, tho' it was corrupted by the groſſeſt

errors, and thereby rendered uſeleſs to mankind.

More certainly we may infer from the ſucceſs which hath attended the attempts of ſome men of real philoſophical genius, what may be done even in metaphyſical ſcience; and what pleaſing and uſeful purpoſes it may ſerve.

All ages and nations have done juſtice to the merits of the Ethics of SOCRATES; and I ſhould think there muſt be either a wonderful defect, or a ſingular perverſion, in the faculties of any man who could peruſe his *Memorabilia*, without much pleaſure and inſtruction. Yet they contain nothing that has even the appearance of novelty or of diſcovery; nothing but what every perſon will recogniſe at once as plain and familiar truth, whenever it is fairly ſtated to him; nothing, in ſhort, but what we could eaſily believe might have been obtained in the form of anſwers to plain queſtions, fairly put, to any man of common ſenſe and common honeſty. The charm of thoſe ſpecimens of the *Socratic* philoſophy

philoſophy chiefly conſiſts (as it appears to me) in the plainneſs, the clearneſs, and the preciſion, with which many important truths are expreſſed, congenial to every underſtanding that is not corrupted by falſe ſcience; and in that ſimplicity and force with which many important precepts are conveyed, welcome to every heart that ſtill can feel the glow of virtue. This is indeed eloquence of the higheſt kind, peculiarly well adapted to the purpoſe in view, and far ſuperior to that employed by PLATO on the ſame ſubject. Though it be eaſy to recogniſe, in many of his dialogues, the ſentiments, and reaſonings, and illuſtrations of SOCRATES; yet it is impoſſible not to perceive, that they are often blended with many of PLATO's own ſpeculations; which have the appearance, without the reality, of more profound knowledge, but are, in truth, leſs intelligible, leſs ſatisfactory, leſs forcible, and leſs applicable to practical uſe, than the modeſt wiſdom of SOCRATES. While the dialogues of XENOPHON, if not perfectly genuine converſations of his maſter, are at leaſt ſo judiciouſly completed, that no

interpolation can be diſcovered; nor any incongruity perceived, in the ſentiments, the illuſtrations, or the manner of reaſoning.

Philoſophers in every age have done juſtice to the Logic of ARISTOTLE, which indeed may fairly be regarded as one of the moſt profound and perfect inveſtigations that the world has yet ſeen of any part of the philoſophy of human thought. It ſhews in the cleareſt light the acuteneſs of his underſtanding, the force of his mind, and his capacity of cloſe and patient thinking: for by ſuch thinking alone, that almoſt perfect hiſtory and theory of ſome of the moſt profound and abſtruſe operations of the human mind muſt have been accompliſhed: they ſurely contain no diſcoveries, nor any thing that ſtrictly ſpeaking can be called a novelty. Nothing that ARISTOTLE hath taught concerning propoſition or ſyllogiſm could appear new or wonderful to any perſon; all that he hath delivered with reſpect to them is only a diſtinct, and accurate, and truly philoſophical account of what ev-

ery

ry perſon muſt recogniſe in himſelf to be juſt, though he never attended to it ſo minutely, nor underſtood it ſo clearly before. I can ſcarce think that even the moſt enthuſiaſtic admirers of ARISTOTLE and his philoſophy could ever believe that he *diſcovered* any kind of ſyllogiſm; or that any kind of ſyllogiſm was good or bad, becauſe he pronounced it to be ſo. If any of them did believe ſo, they were wonderfully miſtaken: he only analyſed propoſitions and ſyllogiſms, and enumerated, and deſcribed, and arranged the various kinds of ſyllogiſms, in which, as he found by due attention to his own thoughts, and perhaps occaſional reference to the thoughts of others, men naturally and inevitably acquieſced. They did ſo before he exiſted: they do ſo at this day, in countries in which his philoſophy and his name are ſtill unknown. Poſſibly to many perſons the Logic of ARISTOTLE will appear to partake more of novelty and invention, and to approach more nearly to the nature of a diſcovery with reſpect to human thought, than I have here repreſented it. But this proceeds entirely from

from the obſcurity of it, and the extreme difficulty of apprehending or learning it; and this obſcurity and difficulty proceed merely from the very abſtruſe manner in which it is expreſſed, which is almoſt always in the moſt general, and abſtract, and technical terms, without the neceſſary examples and illuſtrations: for whenever theſe are given, all obſcurity and difficulty with reſpect to it are at an end; and the learner is naturally diſpoſed to wonder how things ſo plain and eaſy could ever have been rendered difficult and myſterious. The next ſtep very often is, to regard the whole of it with indifference and contempt: but this is unjuſt; for it is not only intereſting as a matter of curioſity, and a profound and accurate inveſtigation of the ſubject, but it has a certain, though no doubt a very limited kind of uſefulneſs in ſcience, by enabling men to detect falſe reaſoning with more eaſe and certainty than otherwiſe they could have done. It muſt ever be a matter of deep regret to all lovers of ſcience, that the importance of that kind of Logic ſhould have been ſo much over-rated, and even the uſe

of

of it ſo completely miſtaken, by ARISTOTLE and his followers. They unluckily conſidered it as a proper and almoſt neceſſary inſtrument for the cultivation of ſcience: but this is ſo far from being the caſe, that it may juſtly be regarded as one of the moſt prepoſterous inſtruments that could be employed for that purpoſe. Far from enabling men to make progreſs in ſcience, it effectually prevented all who employed it from ever doing ſo; and was in truth a perfect nuiſance in every part of ſcience in which it was introduced. I do not think it is going too far to ſay, that ARISTOTLE's Logic, or, to ſpeak more properly, the abſurd uſe that was made of it, was the chief thing that ſtopped the progreſs of all uſeful knowledge for more than two thouſand years.

We have a correſponding inſtance, equally ſtriking, and much more pleaſing, of the influence of metaphyſical ſpeculation on the progreſs of uſeful knowledge, in the Logic, for ſo it may well be called, of BACON; I mean, his principles and his precepts with reſpect to the proper method

thod of cultivating ſcience. Theſe we find diſperſed, and occaſionally illuſtrated, in all his philoſophical writings; but more ſyſtematically arranged, and more concileſy and forcibly expreſſed, in the firſt book of the *Novum Organum*.

All theſe ſpeculations of BACON may fairly be reckoned metaphyſical: they are in truth the Metaphyſics of the ſtudy of nature: they are a rational, and acute, and profound inveſtigation, and a diſtinct expoſition, of thoſe laws of human thought, by which alone we are enabled to acquire accurate and extenſive knowledge, either of ourſelves or of the great world around us. Every perſon who underſtands the philoſophical writings of BACON muſt know, that profound metaphyſical knowledge is neither unattainable by men, nor unſatisfactory to their underſtandings, nor frivolous in itſelf, nor uſeleſs in ſcience. I know not that NEWTON's inveſtigation of the law of gravity, and of the compoſition of light, can juſtly be pronounced more important or more uſeful than BACON's metaphyſical lucubrations; nor do

I conceive, that they have done more honour to human reaſon, or ſhewn in a ſtronger light the ſuperiority of that genius which firſt perceived them, and underſtood their importance, and explained to others the uſeful application that might be made of them.

Yet even BACON's philoſophy is no *diſcovery* in Metaphyſics; nor muſt we imagine that he thought it ſuch, from his calling it a *New Inſtrument*. The practical rules or precepts, deduced from his metaphyſical ſpeculations, might juſtly in his time be regarded as a new and valuable inſtrument in the hands of philoſophers: but the principles on which thoſe rules are founded could no more be thought diſcoveries, or novelties, in human nature, than the moral precepts of SOCRATES, or the logical rules of ARISTOTLE. They are plainly ſuch truths as every perſon of competent judgement, and power of attention to his own thoughts, muſt at once recogniſe in himſelf. Many of them, doubtleſs, muſt have been perceived and acknowledged by preceding

obſervers and inquirers in different parts of ſcience; as, for example, by SOCRATES himſelf: it is highly probable, that in the courſe of the gradual improvement of ſcience, many more, or perhaps all of BACON's obſervations and reaſonings would have occurred to other philoſophers.

It would be unreaſonable indeed to ſuppoſe, that the revival of ſcience, and even the poſſibility of cultivating it with ſucceſs, ſhould have depended on the genius of any individual. It is certain, that long before the time of BACON, perhaps even before the invention of printing, and the conſequent revival of letters in Europe, but certainly immediately after that time, men began to awake out of that lethargy in which they had ſlept for more than a thouſand years of the darkeſt and moſt barbarous ignorance. Their firſt efforts were naturally, and in part uſefully, employed in ſtudying the works of the ancients; in tranſlating them, and commenting on them; in explaining all their ſenſe, and vindicating all their nonſenſe:

for

for the admiration of the reſtorers of learning for every remaining monument of ancient knowledge, knew no bounds. But when this firſt warm zeal for the all-ſufficient labours of the Ancients began to cool, their defects and their errors in many parts of ſcience, and eſpecially in every branch of natural philoſophy, were perceived; and accordingly, before and during the time of BACON, ſeveral men of genius, as for example GALILEO in Italy, and GILBERT (who writes *De Magnete*) in England, began to cultivate the ſcience of nature on a more rational plan, and with more ſucceſs, than any of the ancients had ever done, and in a manner not very different from that recommended in the *Novum Organum*. It is very remarkable, that BACON takes ſo little notice of GALILEO and his writings; with ſome of which, as well as with the hiſtory of his great cotemporary, he muſt have been acquainted. As to his own countryman, GILBERT, it is plain, that he was well acquainted with his works; for he mentions them often, and very particularly, and generally with a degree of contempt

which they do not deſerve. It ſhould ſeem that BACON himſelf did not clearly perceive the merit of thoſe firſt imperfect attempts towards cultivating ſcience on the plan which he was at that very time recommending to all philoſophers. But though he did not, others would have perceived the merit of them, and would have endeavoured to imitate them, probably with various degrees of ſucceſs: and it cannot be doubted, that by careful obſervation, and compariſon of the labours and of the ſucceſs of thoſe philoſophers who cultivated ſcience in that manner, men would gradually have learned the proper method of philoſophiſing. So they would have diſcovered America in a little time, and by gradually improving and extending their navigation, though COLUMBUS had never exiſted; as in fact they did diſcover ſome part of it, by a kind of accident, in a few years after his firſt diſcovery. Yet it is for the honour of human genius, that it was firſt diſcovered by his bold, but judicious and well-conducted enterpriſe.

But

But it is not for thoſe who cultivate the philoſophy of the human mind, to emulate the fame of the diſcoverers of new worlds: that glory belongs to thoſe only who can explore the unknown regions of the great world around them. The ſpeculations of even the greateſt and moſt ſucceſsful metaphyſical inquirers may be juſtly compared to a careful ſurvey and accurate delineation of our native country; which, though a great and uſeful work, could never have given ſcope to the great ſoul of COLUMBUS, nor called forth the genius of the undaunted and perſevering COOK. Or we may compare the work of the Metaphyſician to a plain mirror, which all will acknowledge to be a valuable inſtrument, though it neither excites our admiration, nor extends our views of nature, like the reflecting teleſcope. And ſurely a philoſopher, whoſe darkened eye can find no pleaſure in viewing the image of his hoary hair and withered face, may find much pleaſure and advantage in the uſe of a mirror that ſhall faithfully and diſtinctly reflect to him the features of his mind.

Such

Such an inſtrument every good metaphyſical treatiſe ought to be; and many ſuch will yet be needed to enable mankind to ſee and know themſelves with that clearneſs and preciſion which are to be wiſhed, and certainly may be attained. For there is an infinite difference between that vague, ſuperficial, and inaccurate knowledge of human nature, which all men of common underſtanding acquire by a kind of inſtinct, and that clear, preciſe, and accurate knowledge of it, which may be acquired by careful ſcientific inveſtigation. The difference is almoſt as great, though not of the ſame kind, as that between the inaccurate and ſuperficial knowledge of external objects that all men naturally acquire in the firſt years of their lives, and the more perfect and ſcientific knowledge of them which philoſophers acquire by more careful examination and ſtudy.

A certain degree of knowledge of the qualities and relations of the material objects around us, is indiſpenſably neceſſary for the comfort, and indeed for the preſervation,

vation, of human life; and Nature hath taken effectual care that we ſhall acquire ſuch knowledge, even in our earlieſt years, by the ſpontaneous ſuggeſtions and the inſtinctive exerciſe of our faculties. It would be difficult, or perhaps impoſſible, to eſtimate, with any degree of preciſion, the amount of the knowledge of the things around us, which we acquire in that way: nor is it neceſſary to make ſuch an attempt. We are all diſpoſed to undervalue it, and think it little in compariſon of what we afterwards acquire by our deliberate exertions, becauſe it is common to all men, becauſe we do not remember ever to have been deſtitute of it, and becauſe we acquired it without labour, nay perhaps with pleaſure, when engaged in the purſuit of very different objects, and when we never even ſuſpected that we were learning any thing. Yet we may eaſily convince ourſelves, both of the importance and of the extent of the knowledge which we acquire of the world around us, by the ſpontaneous exerciſe of our faculties; if we will but conſider the very different degrees of knowledge of a new-

born

born infant, and of an ordinary child of ſeven years of age, however little artificial inſtruction the latter may have had. A child could hardly (without the conſtant and very extraordinary care of other perſons) eſcape deſtruction for ſeven years, unleſs it had acquired much knowledge of the things around it. The ſame may be ſaid with reſpect to the inferior animals; but as their faculties are infinitely inferior in degree, if not in ſome meaſure different in kind, from ours, it is ſcarce allowable to make the compariſon. But a child that did not plainly ſhew, long before it was ſeven years of age, that it had acquired and was acquiring much knowledge of the material world, would juſtly be regarded as an idiot.

The caſe is preciſely the ſame, though perhaps it will not be ſo readily acknowledged, with reſpect to the *metaphyſical* knowledge which we acquire in our early infancy; I mean, that knowledge which we acquire of human nature, without labour or difficulty, by the ſpontaneous exertions of our faculties, and by our occaſional

ſional attention to our own thoughts, and to the converſation and actions of others. I will not contend, that this general and almoſt inſtinctive knowledge which we acquire when children, of the principles of thought and of action among mankind, is as immediately and conſtantly neceſſary for our preſervation, as the knowledge of the material objects around us; but it is juſt as neceſſary for our intercourſe with one another. Without it, even language (as already mentioned) could neither be learned nor employed; nor could the actions of an individual who had not acquired the ordinary knowledge of human nature correſpond to thoſe of others. A child who was incapable of acquiring, or would not learn, thoſe rudiments, if they may be ſo called, of Metaphyſics, would as certainly and as juſtly be reckoned an idiot, as one who was ignorant of the commoneſt effects of fire, or of water, or of gravitation.

Imperfect as thoſe rudiments of the philoſophy of mind may juſtly be thought, it appears at leaſt that they are ſufficient for

the purpoſes of common life; juſt as the correſponding rudiments of the knowledge of external nature are ſufficient for the preſervation of mankind. And in both parts of ſcience equally, the pleaſure and the ſolid advantage that mankind have derived from a very limited and imperfect knowledge, ſhould encourage them to extend and to improve their knowledge to the utmoſt of their power.

I am ſenſible that many men of the greateſt talents, and moſt extenſive knowledge, have regarded all metaphyſical ſpeculations with contempt, as not only uſeleſs, but pernicious in ſcience. Though this perſuaſion be raſh and unphiloſophical, it is by no means unaccountable; and I think it may fairly be regarded in the ſame light, and explained on the ſame principles, as SOCRATES's diſtruſt and contempt of aſtronomy, and indeed of all profound philoſophy. Such a perſuaſion muſt, in the preſent age of the world, and in the preſent improved ſtate of aſtronomy, and of many other ſciences, appear almoſt incredible, and altogether unworthy

thy of a wiſe and well-informed man; but nothing could be more reaſonable, nor more characteriſtic of ſound ſenſe and ſuperior judgement, than ſuch an opinion was in the days of SOCRATES; in whoſe time aſtronomy, and almoſt every branch of ſcience, were in a ſtate ſo imperfect, and ſo corrupted by erroneous and extravagant ſyſtems, as to be abſolutely uſeleſs to mankind. But it cannot be doubted, that he, and that every wiſe man, would have approved of the ſtudy of aſtronomy, and of other branches of philoſophy, whenever they were properly cultivated and improved, ſo as to afford real and uſeful knowledge; on the ſame principle that he approved of that kind and degree of aſtronomical knowledge which watchmen and pilots poſſeſſed, and which might be uſeful, by enabling men to know the hours of the night, and to ſteer their courſe when at ſea. In like manner, the *real* knowledge of every part of aſtronomy may be uſeful, either immediately or indirectly, in the meaſurement of time, and in the art of navigation. So may the *real* knowledge of the laws of human thought,

the moſt important part of human nature, be uſeful, not only in ſcientific purſuits, (with a view to which alone I am here conſidering it), but on many other, perhaps much more important, occaſions: for it is not ſcience alone, but *Quicquid agunt homines*, that depends on the laws of human thought; and is, or ought to be, an object of attention to the Metaphyſician, as ultimately proceeding from principles which it is his buſineſs to explore. ——But I muſt put an end to this long digreſſion, and return to the conſideration of the chief cauſes which have contributed to fruſtrate the labours of Metaphyſicians, more than thoſe of phyſical inquirers; and even to bring contempt and reproach on the lucubrations of the former, and on themſelves.

The only other two of theſe cauſes which I think it neceſſary here to conſider, are, the improper uſe of appeals to conſciouſneſs, eſpecially in caſes of keen controverſy; and the employing of ambiguous words and phraſes. The latter indeed has ſometimes been pernicious even in phyſical inquiries;

quiries; but chiefly, as I think, by marring or confounding thoſe metaphyſical principles which are always blended with our phyſical reaſonings, and are indeed eſſential to them. The bad effects of the former have been neceſſarily confined to metaphyſical inquiries. Both of them are very intimately connected with *diſcoveries* in metaphyſics, and ſeem to be requiſite for the making, and they plainly are indiſpenſably neceſſary for the aſſerting and maintaining of ſuch *diſcoveries*.

Conſciouſneſs is the knowing our own preſent thoughts; but, in the language commonly employed on theſe ſubjects, it is more uſual to ſpeak of conſciouſneſs as a *faculty*, by which we know our own thoughts. This expreſſion, like many others of the ſame kind employed in ſpeaking of the various modifications of thought, ſuch as ſeeing, hearing, remembering, willing, chuſing, &c. is in ſeveral reſpects improper, and naturally leads to much error and confuſion in our reaſonings; of which afterwards.

Metaphyſical

Metaphyſical inquiries relate to human thought; and the very object of many of them is, to aſcertain the moſt general, or, if poſſible, the ultimate facts, or indefeaſible laws of it. The moſt obvious and natural way, if not the only way, for men to know accurately their own thoughts on any ſubject, ſeems to be by direct and very ſtrict attention to them. We do not immediately perceive any other way by which men can know their own thoughts, either with reſpect to particular notions and opinions, or to more general laws: nor do we ſee any means of ſupplying defects, or correcting errors, or even of detecting falſehood, in the accounts which men may give of their own thoughts. Yet it muſt be evident, that ſuch defects and errors may often occur, either from the imperfections of the faculties, or want of due attention, or ſtrong attachment to ſome peculiar ſyſtem or opinion, in thoſe who undertake to attend to their own thoughts, and to give an account of them. Admitting even, what I really believe to be the caſe, that all ordinary men are by nature capable of attending directly to their

their own thoughts, and conſequently of knowing them diſtinctly, and giving a clear account of them; ſtill there is reaſon to think, that this faculty, like every other that men enjoy, may be greatly improved by proper exerciſe, and much impaired by want of uſe; ſo that in the latter caſe the exerciſe of it ſhall become not only imperfect, and of courſe almoſt unavailing, but difficult and unpleaſant to the perſon himſelf. The common duties, and buſineſs, and pleaſures of life, not requiring any great or frequent exerciſe of that kind of attention, or reflection, as it is called, it will not probably, in the bulk of mankind, be found in greater perfection than juſt what is requiſite for their ordinary occupations and amuſements, and above all for their intercourſe with one another.

It will probably be found in much greater perfection in thoſe men who have exerciſed it moſt, by frequent and ſtrict attention to their own thoughts, and by compariſon of their own thoughts with thoſe of others, in ſo far as theſe are made known

known to them by ſpeech or writing. Strange as it may appear, it is in this way poſſible that a few men, not naturally of ſuperior faculties, ſhall be found well qualified to inſtruct the reſt of mankind even with reſpect to their own thoughts. Though this muſt ſeem a paradox, it ought to be no more wonderful than many ſimilar facts with which we are well acquainted; ſuch as, the ſuperior ſkill, and quicker diſcernment, and more accurate judgement, of muſicians, with reſpect to ſounds; of painters, with reſpect to the drawing and colouring of pictures; of various manufacturers, with reſpect to the texture, the poliſh, and other tangible qualities of bodies; of ſeafaring men, with reſpect to diſtant objects; of experienced phyſicians, with reſpect to the ſtate of the pulſe, and numberleſs little ſymptons in ſick perſons; of hunters, eſpecially thoſe of ſavage nations, with reſpect to finding and tracing their game. In all theſe and many other inſtances, the ſuperior knowledge which ſome individuals poſſeſs, and even the higher perfection of the faculty by which that knowledge

ledge is acquired, depend partly, no doubt, on the greater frequency, but much more on the greater *attention*, with which it is exerciſed.

On the ſame principle, it may fairly be preſumed, that thoſe who have made the philoſophy of human thought their chief and favourite ſtudy, ſhould be greatly ſuperior to the bulk of mankind, both in the knowledge of it, and in the faculty of reflection, by which that knowledge is acquired; and that they ſhould uniformly and perfectly agree in the accounts which they give of it, or, in other words, in their ſyſtem of metaphyſics.

I have no doubt but that they would have been greatly ſuperior to ordinary men in both reſpects; and that they would have uniformly agreed with one another, as phyſical inquirers have generally, and as Mathematicians have always done, if there had not been ſome circumſtances in their ſituation, and perhaps in the very exerciſe of reflection, and in the nature of

appeals to conſciouſneſs, which tended to confound their obſervations and fruſtrate their labours.

Some of the moſt important of theſe circumſtances may eaſily be ſpecified, and I think the knowledge of them may be of uſe, by ſhewing Metaphyſicians how neceſſary it is either to avoid all appeals to conſciouſneſs, or if they muſt have recourſe to them, to employ them very ſparingly, and with peculiar caution.

In the firſt place, It muſt be obſerved, that as, for all the common and moſt important purpoſes in human life, there is little or no occaſion for ſtrict attention to our own thoughts, or deliberate reflection on them; ſo our attention is given naturally, and almoſt immediately, in all ordinary caſes, to the things which are the objects of our thoughts, the knowledge of which things is of real importance to us; and not to our thoughts themſelves, the accurate ſtudy of which, whatever knowledge it may afford us, is at beſt but of ſecondary uſe, and is hardly intereſting

ing to any but thoſe whoſe object is the philoſophy of the human mind. Accordingly very few, if any perſons, except ſuch philoſophers, or Metaphyſicians, as they are called, have attempted ſuch reflection on their own thoughts, or have given any particular account of their thoughts, as known by direct conſciouſneſs. But moſt of theſe philoſophers have begun and continued ſuch attempts with ſome preconceived opinion, or ſyſtem, or hypotheſis, ſomewhat of the nature of a diſcovery in metaphyſics, concerning that part of the philoſophy of the human mind which they wiſhed to inveſtigate; and to ſuch ſyſtems, whether originally invented by themſelves, or only borrowed from their predeceſſors, moſt Metaphyſicians have been much attached.

Now, whenever ſuch an attachment to any ſyſtem has taken place, but more eſpecially when it is very violent and unreaſonable, as it often hath been, the perſon under the influence of it is no longer perfectly *candid* in his obſervations and reflections; nor can he be altogether truſted

ed in the account which he gives of them. Without meaning to be diſingenuous, perhaps with a ſtrong deſire to be accurate and impartial, he will naturally attend moſt to thoſe circumſtances which favour his ſyſtem, and will overlook thoſe which are adverſe to it.

If his ſyſtem become a ſubject of keen diſpute, as has often happened to metaphyſical ſyſtems, he will naturally take a part in the controverſy; his paſſions will be rouſed, his underſtanding perhaps will be clouded; he will become leſs and leſs candid; victory in the argument, not the inveſtigation of truth, will be his object; he will perhaps be as eager to deceive himſelf, as to confute his opponents; and may in a great meaſure ſucceed in both theſe reſpects, by a raſh appeal to conſciouſneſs; and a bold aſſertion, that, on careful attention, and reflection on his own thoughts, he finds the reſult, on the point in diſpute, conformable to his ſyſtem. The temptation to this kind of diſingennity in ſuch caſes is ſtrong, and the occaſion is very favourable.

able. It does not immediately appear how it can ever be poſſible to convict a man of error, much leſs of falſehood, (for on queſtions of direct conſciouſneſs, error and falſehood are very cloſely connected), with reſpect to his own thoughts. If a perſon has made ſuch a falſe ſtep in metaphyſical reaſoning, and has *erroneouſly* profeſſed to believe, as aſcertained by his own reflection and conſciouſneſs, things implied in his ſyſtem, which are not to be believed, and are not conſiſtent with the reflections and conſciouſneſs of other men, his ſituation inſtantly becomes very embarraſſing, and almoſt hopeleſs. That falſe ſtep cannot be recalled; by it he has placed himſelf beyond the reach of argument or reaſon, and is pledged, not merely in point of underſtanding, but in point of veracity, to maintain his ſyſtem, right or wrong, to the laſt; for an acknowledgement of his error would be at the ſame time a confeſſion of his falſehood. His ſituation, in this reſpect, would be preciſely the ſame with that of a phyſical inquirer, who, in order to ſupport a favourite ſyſtem in phyſics, ſhould deliberately

rately and wilfully give a falſe account of the reſult of his experiments and obſervations.

This kind of diſingenuity has very ſeldom been practiſed in any branch of phyſics, except in Medicine; in which indeed it has long been abundantly common, and conſequently is well underſtood. It ſeems now to be pretty generally conſidered as one of thoſe peccadillos, which, like barbarous Latin, are *Medicis condonanda*; and is perhaps thought juſtifiable on the long eſtabliſhed medical axiom, *Si populus vult decipi, decipiatur.* And, at any rate, great allowances are to be made for thoſe who muſt live by the follies, and fears, and vices of mankind. But I much fear that ſome of my profeſſional brethren have abuſed their privilege in this reſpect, to ſuch a degree as to make it almoſt uſeleſs. The moſt candid, and patient, and experienced phyſicians, who are ſurely the beſt and only competent judges of ſuch a queſtion, have been obliged to confeſs, that great numbers of our medical facts and obſervations are as little to be relied on as our

medical

medical theories; and leſs they cannot be. In a neighbouring country, the ſame remark has been ſo generally made, and is ſo well confirmed, as to be expreſſed in the form of a proverb, *Grand obſervateur, grand menteur;* which my late venerable colleague and preceptor in medicine, Dr Cullen, whoſe long and extenſive experience had fully taught him the truth of it, uſed frequently to quote to his pupils with great acrimony. I much fear the French proverb will ſoon be tranſlated, and naturaliſed in this iſland; and that in a few years a book of medical obſervations will be of as little value or authority, and as little to the credit of the author, as an equal number of medical advertiſements and certificates ſelected from the London Newſpapers.

When either phyſicians or metaphyſicians were diſpoſed to act diſingenuouſly in the account which they gave of their own obſervations, they would be encouraged to do ſo by the evident difficulty, or in many caſes the ſeeming impoſſibility, of detecting any falſity in the account which

which they gave of their own thoughts and their own obſervations. Metaphyſicians could ſcarce have any other motive but mere vanity for acting in ſuch a manner: Phyſicians would have that and more; for not only empty praiſe, but much ſolid pudding, may be earned by aſſuming the character of a great diſcoverer, and obſerver, and improver in medicine. There is reaſon, however, to think, that ſome celebrated Metaphyſicians have not withſtood even the allurements of vanity.

It is certain, that philoſophers, in the proſecution of their metaphyſical reſearches and diſcoveries, have arrived at ſeveral very ſtrange concluſions, which by ſome have been admitted and maintained as ſerious and important truths; and by others have been treated as mere paradoxes, and ingenious ſophiſms. Suppoſing them to be ſophiſms, it has been found in general very difficult to detect them. It cannot be doubted, that it would be very mortifying to the vanity of philoſophers, or of thoſe who wiſhed to be thought ſuch,

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to be obliged to confeſs that they had met with ſophiſms which they could not detect; and ſtill worſe, to be obliged to confeſs, that their ſyſtem involved, by neceſſary inferences, concluſions which were incredible and abſurd. Yet one or other of theſe mortifications could be avoided, by thoſe who were unable to detect the ſuppoſed ſophiſm, only in one of two ways; either by giving up the ſyſtem, or by admitting the concluſion that ſeemed to be implied in it.

It is reaſonable to think that it would be very gratifying to the vanity of ſome philoſophers, or of thoſe who wiſhed to be thought ſuch, to be diſtinguiſhed from the reſt of mankind, by the knowledge of certain doctrines, or the profeſſion of certain opinions, different from thoſe which prevail among the vulgar. The wonderful arrogance and exultation, with which certain metaphyſical opinions, equally ſtrange and uſeleſs, have been maintained by ſome philoſophers, appear to me fully to warrant this ſuppoſition.

Now, *this* gratification could be obtained, and *that* mortification avoided, by the ſimple and eaſy expedient, of appealing to conſciouſneſs, and giving an account of the reſult more agreeable to ſyſtem than to truth. That this expedient has on more occaſions than one been ſucceſsfully employed, I am well convinced.

It will eaſily be judged, that in theſe general obſervations I allude to the ſtrange inferences deduced from the doctrine of Ideas, eſpecially to thoſe given to diſprove the exiſtence, firſt of body, and afterwards of mind; which inferences ſeveral perſons have profeſſed to believe. I own I regard thoſe inferences as ſophiſms, and the profeſſions of belief in them as inſtances of the abuſe of appeals to conſciouſneſs. I ſhould have thought it right for any perſons to ſay, that thoſe inferences were very puzzling, and that they could not diſcover any error in the reaſoning that led to them. I believe indeed the error is not in the reaſoning, but in the principle on which the reaſoning

ing is founded. And it is nowiſe ſurpriſing that men ſhould not ſet about rigorouſly examining, nor even calling in queſtion, a favourite principle, which, though a mere hypotheſis, they had long been accuſtomed to regard as a well-eſtabliſhed fact. From that principle, I preſume, no evidence can be drawn of the exiſtence either of mind or body; and if thoſe who maintained the principle had aſſerted no more than this, there would have been no reaſon to call in queſtion their veracity in the account which they gave of their own thoughts, on making the appeal to conſciouſneſs and reflection. But when they aſſerted that they did not believe in the exiſtence either of mind or body, there is reaſon to think they went a ſtep too far. Mankind in general are ſenſible, that, if *they* were to give ſuch an account of *their* conviction on the ſubject, it would be downright falſehood. They have ample experience of the general uniformity of the laws of human thought, and no evidence of there being any exceptions to them, or any poſſibility of ſetting them aſide, either by voluntary efforts, or

by reaſon and argument. They find the converſation and the actual conduct of thoſe who profeſs ſuch ſtrange opinions nowiſe different from their own; and, ſeemingly at leaſt, quite inconſiſtent with the ſtrange belief which the Metaphyſicians maintain: and they naturally conſider theſe Metaphyſicians as no more worthy of credit in their profeſſions of belief, than they would do men who ſhould maintain, that ſnow appeared to them black, and ink white; or who, in conſideration of the acknowledged imperfection of human reaſon, ſhould declare, that they doubted the truth of all the axioms of geometry, and the validity of every ſyllogiſm and of every kind of demonſtration.

As belief and doubt are always involuntary, I do not think thoſe perſons can reaſonably be blamed who doubt the veracity of men whoſe profeſſions and actions have been ſuch as I here allude to. But as this queſtion is not connected with the ſubject of my inquiry; as I have nothing new to offer with reſpect to it; as I believe

believe the number of thoſe who can be the objects of ſuch unfavourable ſuſpicions is very ſmall, and by no means likely to increaſe; I think it unneceſſary to conſider the point more minutely. But there is another inſtance of the ſame kind of abuſe of appeals to conſciouſneſs, for the ſupport of very erroneous metaphyſical ſyſtems, which I have had in view in theſe general obſervations, and which will require and deſerve more particular attention: I mean the Doctrine of Neceſſity, as conſiſting in the perſuaſion, that the influence of Motives in producing the (ſuppoſed) voluntary Actions of mankind, is either preciſely the ſame with that of phyſical cauſes in producing their ſeveral effects in lifeleſs bodies, or at leaſt ſo nearly the ſame, (that is, making due allowance for the greater number and different nature of the ſteps interpoſed between the motive applied and the ultimate overt action performed in conſequence of it), as to be abſolute and irreſiſtible in the one caſe as well as in the other; and completely to exclude the ſuppoſed exertion, and poſſeſſion, nay even the poſſibility, of any liberty,

liberty, or ſelf-governing power, in living perſons, as well as in lifeleſs bodies.

This much agitated queſtion, as being an important part of my own inquiry, I have had occaſion to examine minutely and rigorouſly; and, with every poſſible precaution, and every aſſiſtance to ſtrict reaſoning that I could contrive; many of which I am ſure had never been employed nor thought of before on this ſubject. By theſe means, I think, I have been enabled to aſcertain ſome points relating to it with a degree and kind of evidence not formerly thought attainable on ſuch a metaphyſical queſtion.

One of the moſt curious and intereſting of theſe points which I have thus aſcertained is, that the ready admiſſion and arrogant aſſertion of the neceſſary conſequences of the philoſophical doctrine which appear the moſt repugnant to the general opinion, or what is called the common ſenſe of mankind, are uniformly limited to thoſe caſes only in which the appeal with reſpect to the truth of them

as

as matters of fact is to be made to conſciouſneſs.

The inferences from the doctrine in queſtion, which I have had occaſion to hear or think of, are of two kinds; the firſt kind comprehending all neceſſary inferences from it with reſpect to the conduct of mankind in certain given or ſuppoſable circumſtances; the ſecond kind comprehending the judgements or moral ſentiments of mankind with reſpect to the merit or demerit of ſuch actual or ſuppoſable conduct.

To the bulk of mankind the ſuppoſition that there can be moral merit or demerit without ſelf-governing power in the perſon acting, appears palpably abſurd; the latter notion being as much involved in the former, as thoſe of time and ſpace are in that of motion. But many Metaphyſicians have got over this difficulty, by the eaſy expedient of appealing to conſciouſneſs; and have boldly declared, not only that ſelf-governing power is not eſſential to merit or demerit, according to their notions,

notions, but that it has nothing whatever to do with it. Some of them even, as I have found on actual trial, not only aſſert this general propoſition, but admit it in particular inſtances, though of ſuch a kind that I had ſelected them as ludicrous, as well as abſurd; in full confidence that thoſe to whom I ſtated them would never venture to admit them, and would of courſe give up the doctrine in which they were neceſſarily implied. But in this confidence I found myſelf wonderfully miſtaken. As in all theſe caſes the queſtion of fact was to be decided by a direct appeal to conſciouſneſs; and as thoſe with whom I had occaſion to argue gave an account of their conſciouſneſs, and their ſentiments, diametrically oppoſite to what I found to be true with reſpect to mine; and as I was ſenſible that I had no ſuperiority over them, which could intitle my thoughts to greater regard, or my aſſertions to greater credit, than theirs in direct contradiction to mine; I thought it expedient to drop entirely the conſideration of ſuch caſes, and to turn my attention towards thoſe other

caſes

caſes which related merely to the actual conduct, or overt actions, of mankind.

The doctrine of Neceſſity ſeems to imply many neceſſary inferences with reſpect to the actual conduct of men, on the application of motives, ſtrictly correſponding to the reſult in ſimilar caſes of the application of phyſical cauſes to lifeleſs bodies; but widely different from what might be, and probably would be, the reſult, on the ſuppoſition of liberty, or ſelf-governing power, in the agents: As, for example, in the caſe of equal and oppoſite motives applied at the ſame time; in which caſe, according to the principle, and the analogy of the balance with equal weights in each ſcale, the perſon would neceſſarily remain inactive; but, according to the popular notion of ſelf-governing power, might, and probably would, chooſe and act according to one of the motives, in preference or oppoſition to the other.

Such caſes ſeemed, at firſt view, to afford a fair opportunity of bringing the

controverted points to the fair teſt of open unequivocal experiment; to which indeed the aſſertors of the Doctrine of Neceſſity have often and very confidently appealed, or pretended to appeal: as, for example, DR PRIESTLY, in the following paſſage.

" Moreover, we ſee evidently, not " only that men are determined to act " by certain motives, but that the *vigour* " of their actions correſponds to what may " be called the *intenſity* of their motives. " If a maſter be actuated ſimply by his " anger, he will beat his ſervant more " violently, and continue the correction " longer, in proportion to the degree of " his anger, or the apprehended cauſe of " his diſpleaſure; and kindneſs operates " exactly in the ſame manner, a ſtronger " affection prompting to greater and more " kind offices than a weaker.

" Alſo oppoſite motives, as cauſes of " love and hatred, are known to balance " one another, exactly like weights in op- " poſite ſcales. According to all appear- " ance,

" ance, nothing can act more invariably,
" or mechanically. —— Strengthen the
" motive, and the action is more vigo-
" rous; diminiſh it, and its vigour is a-
" bated; change the motive, and the ac-
" tion is changed; entirely withdraw it,
" and the action ceaſes; introduce an op-
" poſite motive of equal weight, and all
" action is ſuſpended, juſt as a limb is
" kept motionleſs by the equal action of
" antagoniſt muſcles. As far as we can
" judge, *motives* and *actions* do in all
" poſſible caſes ſtrictly correſpond to each
" other."

Now, all this appears very diſtinct and plauſible, and ſeems to be a fair appeal to many familiar and unequivocal obſervations and experiments; but in truth it is altogether nugatory: Of all that are mentioned, or alluded to, not *one* obſervation or experiment is unequivocal, or fair, or concluſive; nor do I believe, that Dr Priestly, or any other Metaphyſician, ever ſeriouſly intended to reſt the deciſion of the controverſy on ſuch experiments as he has ſuggeſted; that is, to abide by the

reſult of them, whether favourable or adverſe to their ſyſtem. I know, that, in every inſtance in which the reſult correſponded with the ſyſtem, the experiment would be reckoned valid, and held as concluſive evidence of the doctrine. But I know likewiſe, that whenever the reſult was adverſe to the doctrine, the experiment would be ſet aſide, or explained away, as inconcluſive; and that, by a kind of philoſophical legerdemain, we ſhould inſtantly get an appeal to conſcioufneſs, inſtead of the propoſed appeal to open unequivocal experiment.

Thus, for example, if in any caſe the action performed did not correſpond to the motive known to be applied, which happens times innumerable every day, it would immediately be *ſuppoſed*, and aſſerted confidently, as a thing clear beyond the poſſibility of diſpute, that ſome other motive had occurred which balanced or counteracted the one originally known to be applied. If, on the application of two preciſely equal and oppoſite motives at once, for inſtance, the offer of a ſhilling,

ling, or of a guinea, to a porter, on condition that he ſhould go one way, and of an equal ſum on condition that he ſhould go another way, the two oppoſite motives ſhould not balance each other, like equal weights in oppoſite ſcales, and the perſon ſhould chooſe and act according to one of them, diſregarding the other, which will almoſt univerſally happen, it will inſtantly be *ſuppoſed*, and aſſerted, that the perſon found or fancied ſome additional motive on one ſide, which was enough to turn the balance. If, on increaſing the *intenſity* of the motive, the *vigour* or *quantity* of the action ſhould not be increaſed in proportion, nor even in any degree, which will almoſt univerſally happen whenever a perſon is offered, either from miſtake, or whim, or generoſity in his employer, or for the ſake of the experiment, much more for doing any ordinary kind of work than the common and reaſonable payment for it; as, for example, if a labourer were offered a guinea, or an hundred guineas, inſtead of a ſhilling, for one day's work, it would be *ſuppoſed*, that he had ſome other motive to counteract that

that one, and limit its effect. If, on diminiſhing the motive, the action was not diminiſhed; if, on changing the motive, the action was not changed; if, on withdrawing altogether the motive, the action did not ceaſe; the ſame kind of *ſuppoſitions*, varied according to circumſtances, ſo as to ſuit each particular caſe, would inſtantly be made. To ſay that they were gratuitous and unphiloſophical, and to deny them poſitively, would avail nothing; for the moſt poſitive denial of any thing is no more a proof of its falſity, than a confident aſſertion of it is of its truth. This can only be aſcertained by an appeal to reflection and conſciouſneſs, which is little better than an appeal to the candour and veracity of men who are engaged in very keen, and perhaps very angry controverſy. Yet to ſuch fruitleſs appeals, inſtead of that propoſed, of open and concluſive experiment, the deciſion of the queſtion is brought by the eaſy expedient of arbitrary ſuppoſitions; which in reality amount to a ſyſtematic attempt to try the truth of a matter of fact by its conſiſtency with a preconceived opinion or theory;

theory; inſtead of trying the truth of the theory, as reaſon requires we ſhould do, by its conſiſtency with matter of fact.

Fully aware of the futility of ſuch a mode of reaſoning, I have taken peculiar care, neither to make, nor to admit, nor to deny, any ſuch ſuppoſitions; and never to make any appeal, directly or indirectly, to reflection or conſciouſneſs, with reſpect to the truth of any ſuppoſed matter of fact. Indeed I make no further appeal to the thoughts of mankind, on the ſubject in queſtion, than is done in geometry; I mean, for the admiſſion of axioms, or ſelf-evident neceſſary truths, and for the validity of ſtrictly logical inferences; leaving always the deciſion of every queſtion of fact to open unequivocal experiment, that neither directly nor indirectly involves or admits of any appeal to conſciouſneſs.

Proceeding on this plan, I ſoon made a very curious diſcovery;—not in metaphyſics, I own, but with reſpect to Metaphyſicians. Wherever I pointed out to them neceſſary

neceſſary inferences from their own principle, which might at once be brought to the teſt of open unequivocal experiment, and admitted of no appeal to conſciouſneſs, they perceived intuitively, without having occaſion to make any experiment, that thoſe neceſſary inferences were falſe in point of fact; and they thought them ridiculous; which I, and many others who denied the principle of Neceſſity, had done before. Yet all my inferences were ſtrictly analogous to the actual reſult, in ſimilar caſes, of the application of phyſical cauſes to lifeleſs bodies, as thoſe who ſaw the falſity of them with reſpect to living perſons well knew; and ſome of them were merely particular inſtances of certain general propoſitions, which thoſe to whom I ſtated them, and indeed all Metaphyſicians who hold the doctrine of Neceſſity, were accuſtomed not only to admit, but to aſſert in the ſtrongeſt terms, as univerſally and neceſſarily true.

I hope ſome Metaphyſician will find leiſure to conſider maturely this ſingular occurrence;

occurrence; and will endeavour to account for it in a manner more creditable to himſelf and his brethren than I am able to do. But, in the mean time, I have no ſcruple to ſay of them and their conduct, what I am ſure they would think of me and mine, if I were to act as they have done; that is, if I were to aſſert in the ſtrongeſt terms, as my firm belief, a doctrine which mankind in general, and they in particular, thought abſurd and incredible; and if I were to admit every neceſſary inference from it, however repugnant to the general ſenſe of mankind, which was to be decided by an appeal to conſciouſneſs; and yet were uniformly and intuitively to perceive and acknowledge the falſity of every neceſſary inference from my own doctrine, which did not admit of ſuch appeals, and might be brought to the teſt of open and concluſive experiment.

My firm perſuaſion on this point is, that thoſe who have maintained the doctrine of Neceſſity have acted uncandidly, as well as unreaſonably.

Let it not be ſuppoſed, that, in hazarding this aſſertion, I fall into the diſgraceful error, of calling in queſtion the ſincerity of any individual, or any ſet of men, for holding opinions different from mine, and different from thoſe of mankind in general. No perſon can feel more ſtrongly than I do, how illiberal, as well as unreaſonable, ſuch conduct would be. I know well that there are many defects, and often great peculiarities, and ſometimes wonderful diſorders, in the faculties of different individuals; which will ſufficiently account for their maintaining very extravagant opinions, without affording the ſmalleſt ground to impeach their veracity.

It is on the clear and uniform obſervation of *deliberate inconſiſtency* in a particular ſet of men, and on it alone, that my conviction of their *mala fides* is founded.

I need not ſay that I am willing to be judged by the ſame teſt myſelf, whenever my veracity ſhall be called in queſtion; for I know that I muſt be ſo, whether I will

will or not; and that I ſhould be exceedingly laughed at, if I attempted to remonſtrate againſt it. I preſume the caſe would be the ſame with my Lord High Chancellor, and with the Twelve Judges of England, if they were placed in the ſame circumſtances; for no rank however exalted, no talents however acknowledged, no character however eſtabliſhed, can exempt a man from the laws of human thought.

The moſt ſacred, and uniform, and indefeaſible of theſe laws, are the intuitive perception of ſelf-evident neceſſary truth, and the irreſiſtible conviction of neceſſary connection: theſe laws accordingly are the very baſis of the moſt perfect ſcience; the former conſtituting the eſſence of an axiom, the latter that of a ſyllogiſm. To diſſent from either of theſe, would inevitably be regarded as a renunciation of Truth as well as Reaſon.

Even in numberleſs caſes where axioms and ſyllogiſms are out of the queſtion, inconſiſtency in various reſpects may afford

ford ample proof of inſincerity; and is every day admitted as complete evidence of it, both in the common conduct of life, and in the moſt ſerious diſcuſſions in courts of juſtice; in which there is often occaſion to judge of the ſincerity of men in their aſſertions.

Thus, for example, if a perſon whoſe eyes were open, and quite clear, and to all appearance perfect, ſhould declare, that even in the beſt light he could ſee nothing, and that he was ſtone blind; however peculiar his caſe might be thought, and however unaccountable it would be to the bulk of mankind, there could be no good reaſon to call in queſtion his veracity. If his conduct uniformly correſponded to his account of himſelf; if he was never obſerved to diſtinguiſh viſible objects, nor to act as men do by the help of their ſight; and was often obſerved to ſuffer the many inconveniencies and embarraſſments which blind men feel; I conceive, that even the moſt uncandid and uncharitable, who might at firſt have ſuſpected him of impoſture, would ſoon be convinced that his

his blindneſs was real; and that a magiſtrate who ſhould take it into his head to conſider him as an impoſtor, and puniſh him accordingly, would be unjuſt and cruel, as well as unreaſonable. But let us ſuppoſe, that ſuch a perſon, having no apparent defect in his organs of ſight, but yet, declaring that he was blind, ſhould go about, without difficulty or embarraſſment, in places where he was an utter ſtranger, and read and write, and diſtinguiſh diſtant and viſible objects, and, in ſhort, act uniformly, on all occaſions, like men who had the uſe of their eyes; I conceive, that even the moſt candid and charitable would inevitably regard him as an impoſtor; and that a magiſtrate would be juſtified in puniſhing him as ſuch.

There have been ſeveral inſtances of a ſtill more peculiar and limited defect of ſight, which diſqualified ſome individuals, and one whole family, for diſtinguiſhing certain colours; though in other reſpects their ſight was good. I am myſelf acquainted with one gentleman who cannot

cannot diſtinguiſh red from green; and with another who cannot well diſtinguiſh the different ſhades of blue, nor the colours bordering on blue, like indigo and violet; nor the colours in the compoſition of which blue has a ſhare, like purple. This kind of peculiarity and defect of ſight I conceive to be ſomewhat analogous to the peculiarity and defect of apprehenſion or underſtanding in thoſe who profeſs that they cannot perceive any difference between the relation (or influence) of motive and that of phyſical cauſe. The ſincerity of thoſe who declare that they have ſuch a peculiar defect of ſight cannot, without great injuſtice, be called in queſtion, while their actual conduct correſponds to their declarations. But if ever it is found that any of them did and do uniformly diſtinguiſh thoſe colours which they ſaid they could not diſtinguiſh, it will inſtantly be known, that, on the part of theſe perſons at leaſt, there was no defect of ſight, but mere pretence and impoſture.

On the ſame principle, it would be very wrong to call in queſtion the *bona fides* of

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a perſon who ſhould declare, that he believed his legs to be made of ſtraw, and his poſteriors of glaſs; both which opinions have been entertained by ſome individuals; and, to the beſt of my judgement, are not more repugnant to good ſenſe, and clear evidence of the plaineſt and moſt direct kind, nor do they require and imply in thoſe who entertain them a mode of actual conduct more extravagant, or more different from that of ordinary men, than the doctrine of Neceſſity, *when fairly and ſtrictly examined.* If a perſon holding theſe peculiar opinions were to write any reaſonable number of volumes, to prove that ſuch was the caſe, not with himſelf only, but with all mankind; and ſhould get many diſciples to adopt and to maintain this doctrine of Glaſs and Straw; wonderful as ſuch a peculiarity of opinion muſt appear, there would be no evidence of *mala fides* in thoſe who profeſſed it, provided only that their actions correſponded to their profeſſions. And if all of them were uniformly at great pains to preſerve from harm thoſe ſuppoſed frail parts of their conſtitutions, as I am well aſſured

aſſured ſome perſons have been who held ſuch opinions, we ſhould be obliged to give them credit for their ſincerity, though no doubt at the expence of their underſtanding. But if it were found, that all perſons of this ſingular perſuaſion acted in all caſes juſt like other men, never ſhewing in their conduct any marks of inſanity, and walking, dancing, riding, leaping, when they had occaſion to do ſo, without taking any peculiar care of the infirm parts of their bodies; it would be very difficult not to call in queſtion their veracity. And if any perſon, peculiarly deſirous either to ſet them right in their opinions with reſpect to thoſe parts of human nature, or at leaſt to find out in what reſpect they were wrong, ſhould propoſe to try them, or to inſtruct them, in the way of experiment; and after convincing them, by many trials, or finding them convinced beforehand, that glaſs could not be cut with a razor, and that ſtraw would not bleed when cut with one, ſhould propoſe to them, one by one, to try the effect of a proper application of a razor to thoſe parts of their bodies which they

they aſſerted were made of ſtraw and of glaſs; and if they ſhould all with one accord take the alarm at the mention of ſuch an experiment, and refuſe either to ſubmit to it themſelves, or to abide by the reſult of it when tried on others; then I think it could no longer admit of doubt, that the opinion which they profeſſed to believe was a mere pretence.

I here content myſelf with pointing out the fact, which I preſume will not be diſputed, that in ſuch caſes our conviction of *mala fides* in thoſe whoſe conduct is ſo inconſiſtent with their profeſſions, would be complete and irreſiſtible. I leave the inveſtigation of the principle on which this conviction depends to the curious, and to thoſe who ſhall think it neceſſary. The application of it will be eaſily underſtood; and if, on a careful examination of my argument, it be not found ſtrictly juſt, great indeed will be my condemnation.

Such are the concluſions, which, it may be obſerved, are not merely ſpeculative,

but uſefully practical, to which I have been led by conſidering the improper uſe of appeals to conſciouſneſs in metaphyſical reſearches.

The laſt circumſtance to be mentioned, as tending peculiarly to fruſtrate ſuch reſearches more than thoſe of phyſical inquirers, is the uſe of improper, and chiefly of ambiguous, words and phraſes.

This evil has been ſo long and generally obſerved, the greatneſs of it has been ſo often felt, and ſo many good remarks have been made on it by different authors, that it is not neceſſary to conſider the ſubject at ſuch length as otherwiſe the importance of it would have required: nor is it indeed eaſy to add any thing of much value to what many diſtinguiſhed philoſophers, from BACON to DR REID, incluſively, have delivered on this ſubject.

The obſervations of BACON are not only the moſt original, but the moſt comprehenſive, and moſt important, that I have ever ſeen. Some of them, however, are

are obſcure, by reaſon of the brevity, and perhaps even an affected ſententiouſneſs, with which they are expreſſed, and the want of ſufficient illuſtration by proper inſtances: and it muſt be owned, that ſome of them are rendered almoſt diſguſting, and have the appearance of whim and extravagance, by the metaphorical and almoſt allegorical manner in which he has choſen to expreſs them; and his unlucky and unreaſonable attachment to his quaint conceit of *Idols*, which, as he ſays, beſet, and occupy, and pervert the underſtanding, in many different ways. Poſſibly this is the reaſon why his obſervations on this ſubject have not met with that general regard which they deſerved, and which many of his precepts on other points have met with, from thoſe who have been the moſt ardent and ſucceſsful in the purſuits of ſcience. No perſon who would take the trouble to ſtudy the profound ſenſe of BACON's obſervations on this ſubject, (the *Idola Fori*, in his allegorical language), could ever doubt of the truth or the importance of them: but there is reaſon to think, that many philoſophers, and eſpecially

Metaphyſicians, have not taken the trouble to conſider them with due attention. This may be inferred from the well-known and too familiar facts, that to this day the uſe of very improper and ambiguous terms, and thoſe fruitleſs endleſs diſputes which inevitably reſult from them, ſtill prevail in ſeveral branches of ſcience, and moſt remarkably in the ſcience of mind; though BACON has not only ſhewn the nature, and origin, and the conſequences, of ſuch abuſes, but ſufficiently explained the means, and I believe the only poſſible means, by which they are to be rectified.

Sunt etiam IDOLA *tanquam ex contractu et ſocietate humani generis ad invicem, quæ* IDOLA FORI, *propter hominum commercium et conſortium, appellamus. Homines enim per ſermones ſociantur; at verba ex captu vulgi imponuntur. Itaque mala et inepta verborum impoſitio miris modis intellectum obſidet. Neque definitiones aut explicationes, quibus homines docti ſe munire et vindicare in nonnullis conſueverunt, rem ullo modo reſtituunt: ſed verba plane vim faciunt intellectui, et omnia*

omnia turbant; et homines ad inanes et innumeras controverſias, et commenta deducunt.

IDOLA *quæ per verba intellectui imponuntur, duorum generum ſunt: aut enim ſunt rerum nomina quæ non ſunt; (quemadmodum enim ſunt res quæ nomine carent, per inobſervationem; ita ſunt et nomina, quæ carent rebus, per ſuppoſitionem phantaſticam); aut ſunt nomina rerum quæ ſunt, ſed confuſa, et male terminata, et temere, et inæqualiter, a rebus abſtracta.*

NOV. ORG. *lib.* 1. 43. 60.

BACON too points out very well the folly of attempting to rectify ſuch evils merely by arbitrary or any definitions or explanations, for this plain reaſon, that theſe muſt themſelves conſiſt of words; and words, as he remarks, beget words: in truth, they ſeem to be very prolific. He likewiſe recommends the only feaſible expedient to get the better of them; which is, to have recourſe conſtantly to the particular inſtances of the things themſelves about which we mean to reaſon, and to examine

examine carefully and patiently all their relations and connections, their differences as well as their reſemblances.

Words are merely the arbitrary ſigns or ſymbols of thoughts; *Notionum teſſeræ*, as he very aptly calls them. Without the uſe of ſome kind of tokens of thought, we could not know enough of one another's thoughts on many ſubjects, for almoſt any uſeful purpoſe; thoughts themſelves not being the objects of any of our ſenſes. The words, or other ſigns, employed to expreſs our notions of external objects, will be ſufficiently explained by the uniform uſe and application of them, or occaſionally by reference to the things themſelves which we wiſh to denote. From the general uniformity of the human faculties, the notions of all men (except in a few very rare inſtances) will be the ſame with reſpect to ſuch external objects as they have occaſion to examine; and the general words denoting them will be well and uniformly underſtood; juſt as proper names are by thoſe who know intimately the perſons and things to which they are given. It

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can very ſeldom happen, that a word denoting any external object ſhall be obſcure or ambiguous; and if ever this ſhould be the caſe, the evil muſt be of ſhort continuance, and can have no bad effects; for it may be removed in a moment, by reference to the object itſelf; and certainly will be ſo, whenever any miſtake, or doubt, or embarraſſment occurs, in conſequence of ſuch ambiguity.

But this cannot be done ſo eaſily, nor in the ſame manner, with reſpect to things intellectual. The impoſition of names to theſe, is, if poſſible, more neceſſary for diſcourſe about them, than the nomenclature of external objects is to enable us to ſpeak intelligibly about them. It ſeems to have been thought equally eaſy, and has been generally attempted with little care, and no peculiar attention; which indeed could not be expected in the firſt rude contrivers of every language. Yet there could be no exhibition of the thing meant, nor any preciſe and pointed reference to it, to ſettle the meaning of the word denoting it, either originally at its

its firſt impoſition, or ſubſequently, on ſome miſtakes or embarraſſments occurring from the uſe of a word, that was not fully nor uniformly underſtood by thoſe who uſed it, or by thoſe to whom it was addreſſed. It might very naturally remain in uſe, and acquire authority, even with all its imperfections on its head, and ſoon come to be a part of language too firmly eſtabliſhed to be altered by thoſe who alone could know the impropriety of it, but who perhaps might not know how to rectify it effectually, and whoſe numbers, at any rate, would be too ſmall, and probably whoſe purſuits would be too much diſregarded by the bulk of mankind, to procure for them either attention to their remonſtrances, or influence enough to effect ſuch a reformation as they might reaſonably propoſe.

This I take to be the real hiſtory of the introduction, and the general uſe, and the inveterate eſtabliſhment, of many ambiguous and otherwiſe improper expreſſions, eſpecially with reſpect to things intellectual; which kind of expreſſions is not peculiar

culiar to a few languages, but is found almoſt univerſally in all, and may juſtly be reckoned one of the principal cauſes of the greater obſcurity, and difficulty, and ſlower progreſs, of metaphyſical than of phyſical ſcience.

Of all the imperfections that any word or phraſe in actual uſe can have, the moſt common and natural, and beyond all doubt the worſt with a view to ſtrict reaſoning, is ambiguity; that is, the confounding of different thoughts. By it the very purpoſe of artificial language, as diſtinguiſhed from natural, namely, the communicating of thought preciſely and diſtinctly, is fruſtrated moſt effectually; and what aggravates very much the evil is, that thoſe concerned do not always find it out. They think they underſtand one another, when in truth they do not. Nay, though it has rather too much the appearance of a paradox, yet I believe it may be ſaid with great truth, that ſome philoſophers have not always underſtood themſelves in ſome of their moſt elaborate ſpeculations, which they endeavoured to car-

ry on by the uſe of ambiguous expreſſions. For moſt men even think, in a great meaſure, by the help of words, on many occaſions; eſpecially on ſubjects of ſcientific reſearch, in which a long train of diſcourſe or reaſoning is requiſite: and if the language they employed were perfect, or nearly ſo, and abſolutely preciſe and free from ambiguity, like the algebraical notation employed by Mathematicians, they would find great advantages from the uſe of words; which in this caſe would not only ſerve to diſtinguiſh their thoughts, but alſo to arreſt and detain them, and thereby give to philoſophers a more perfect command of them than otherwiſe they could have. Thoughts are of their own nature fleeting; ſeldom to be recalled, juſt at the time when we want them, without ſome effort, and difficulty, and delay; and often not to be recalled, by any effort that we can make, at leaſt in proper time to ſerve the purpoſe required. But if they were fairly and diſtinctly repreſented, by preciſe words or ſymbols, theſe might be employed as freely and confidently, I mean, with as little danger

danger of miſtake, as the Indian cyphers are by an accountant in common arithmetical calculation; or as bank-bills are by merchants in their tranſactions with one another; for every cypher, and every bank-bill, ſo employed, repreſents, without the ſmalleſt poſſible ambiguity, the very things, or notions of things, which it is intended they ſhould repreſent; that is, produces invariably in all concerned juſt that thought, *tantum et tale*, or that combination of thoughts, which there was occaſion to produce in them.

Hence it is that ambiguity may juſtly be reckoned worſe than any degree of mere obſcurity in the expreſſion of thought; it is worſe even than not being at all underſtood. A confuſion of tongues as complete as that of Babel, nay, even the total loſs of ſpeech, though they would prevent the communication of thought by words, would not prevent the diſtinct exerciſe of thought in each individual ſeparately; nor would they hinder a perſon from proſecuting a long train of thought, and perhaps

ſhewing clearly by his conduct, that he had done ſo to very good purpoſe.

But let us conſider what would be the reſult, if a perſon ſhould attempt to tell any very ſimple ſtory, in which but half a dozen perſons were concerned, employing only one or two proper names to denote all the different perſons who were to be mentioned. Any one who does not clearly perceive what the reſult *muſt* be, may try the experiment, and will ſoon convince himſelf that the attempt is hopeleſs. I do not think it going too far to ſay, that the talents of *Demoſthenes*, and *Cicero*, and *Herodotus*, and *Tacitus*, united, could not enable a perſon who ſhould proceed on ſuch a plan to tell any ſtory in ſuch a manner that others could rightly and uniformly underſtand him. I will even venture to give it as my opinion, that he could not well underſtand himſelf in telling or reading his own compoſition, however well he might have known the ſtory before he expreſſed it in ſuch preposterous terms, and however diſtinctly he might remember it afterwards. I conceive

conceive that the uſe of ſuch ambiguous proper names, as I have ſuppoſed, would, during the time they were employed, confound his own underſtanding, as well as that of every perſon to whom his diſcourſe was addreſſed.

Next, let us conſider the caſe of Mathematicians, whoſe reaſonings have always, and moſt juſtly, been regarded as perfect and exemplary in point of clearneſs and accuracy. Nothing is more eſſential to this than the abſolute preciſion of all the terms which they employ. What would become of the beſt of them, and of their demonſtrations, if they were obliged to employ only one or two words, to denote all the various relations of equal, greater, and leſs, perpendicular, oblique, and parallel; or if they had but one or two words, to expreſs a circle, an ellipſe, and a parabola, a ſphere and a cube, a cone and a cylinder? What would become of the beſt Algebraiſts, and of their calculations, if they were obliged to uſe only one or two *ſigns*, to denote addition, ſubtraction, multiplication, diviſion, the ſquare and

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the cube, the ſquare root and the cube root, and only one or two *letters*, to denote many different quantities? —It muſt be evident, I think, that the lucubrations of Mathematicians, proceeding on ſuch a plan, would be at leaſt as obſcure, and confuſed, and unſatisfactory, and erroneous, and uſeleſs, and as diſguſting to every man of good ſenſe, and zeal and taſte for ſcience, as any ſpeculations that ever were advanced in metaphyſics.

Let us ſuppoſe, that bank-bills were ſo ambiguouſly worded, that many of them might be underſtood individually to denote different ſums of money, either at the ſame time, or occaſionally at different times, and in the hands of different perſons: Would it be *poſſible* for merchants, or for any men of ſenſe, *ever* to agree about the payment of an account in ſuch bank-bills?

Laſtly, Let us ſuppoſe, that, in common arithmetic, we were to uſe one or two of the Indian cyphers, to expreſs two or three different numbers each; what would become

become of arithmetical calculation, which at preſent is ſo diſtinct and ſatisfactory, and ſo eaſy and familiar to us all? None of us, I apprehend, would be able to ſum up a ſingle page of an account; and I preſume the beſt accountants in the world would be as long and as completely puzzled with a ſimple queſtion in the rule of Three, as Metaphyſicians, from PLATO and ARISTOTLE down to MR HUME and DR PRIESTLY, have been with the doctrine of Cauſes; and, after all, would probably go as far wrong in their concluſions; if they ſhould ever think of bringing their work to a concluſion. But it would depend entirely on themſelves to do this, or to continue their reſearches for ever. For it is the peculiar prerogative of reaſonings by means of ambiguous terms, that they may, with equal pleaſure and advantage, be continued *ad infinitum*; always doing, never done: in this reſpect, they are vaſtly ſuperior to mathematical, and even to phyſical diſcuſſions, which in general may ſoon be brought to a deciſion.

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All theſe ſuppoſitions are imaginary; and they are of the nature of extreme caſes: but, to the beſt of my judgement, the evil neceſſarily reſulting from the ſuppoſition made in each caſe is nowiſe exaggerated; and all the caſes ſtated are ſtrictly parallel to the real caſes which I have in view, and am to examine.

In conſidering many parts of the philoſophy both of mind and of body, a great number of different notions, and things which are the objects of ſuch notions, muſt be examined and compared, in order to aſcertain wherein they agree, and wherein they differ, and what are their various relations to one another. This is very particularly the caſe with reſpect to that part of philoſophy which I wiſh to inveſtigate, namely, the doctrine of Cauſes, and the nature and various kinds of Cauſes, to which *Events*, by whatever name they may be called, whether Changes, Effects, Actions, or Phænomena, muſt be referred. In this inquiry, the notions of Exiſtence, Subſtance, Quality, State, Event, Change, Effect, Action, Cauſe, Agency,

gency, Power, Influence, Neceſſity, Force, Mind, Body, Faculty, Motive, and many others, are to be examined, and compared, both with one another, and with the things which are the objects of them. By comparing them with one another, we may learn wherein they agree or differ; by comparing them with their proper objects, or with the inſtances to which we conceive that they correſpond, and from which, however careleſsly or imperfectly obſerved by us, we have reaſon to think that they are principally derived, we may know how far they agree with ſuch inſtances, or, in other words, how far they are juſt. It is obvious, that theſe two ſorts of compariſons muſt be very intimately connected; and that they muſt be mutually ſubſervient to each other: and it is not obvious, nor for my own part do I believe, that there can be more than one way of conducting with ſucceſs ſuch compariſons, and ſuch an examination, as is propoſed.

For this purpoſe, one of the firſt and moſt eſſential requiſites would be, that we ſhould, in all our thoughts and reaſonings,

ſonings, carefully diſtinguiſh all thoſe different notions; for that all or many of them are ſomehow to be diſtinguiſhed, cannot reaſonably be diſputed. The ſecond requiſite would be, that we ſhould, in our diſcourſe, as uniformly and perfectly denote them by different expreſſions, as Mathematicians always do all the different notions which enter into their reaſonings; as, for example, equal, greater, leſs, perpendicular, oblique, parallel, addition, ſubtraction, diviſion.

The former of theſe two requiſites I conſider as abſolutely indiſpenſable, and as attainable with due care and pains; the latter of them, if it be phyſically or morally poſſible, is, I fear, only practicable with ſuch extreme difficulty, and ſo ſlowly, that it may almoſt be regarded as unattainable; eſpecially in the beginning of ſuch an undertaking. It would require a great innovation in common language; particularly with reſpect to the limiting ſtrictly the meaning of many familiar words and phraſes; which is always more difficult (by reaſon of the deeply

deeply rivetted principles of habit and aſſociation) than to aboliſh old or to introduce new expreſſions. Such an innovation no individual whatever could reaſonably hope to effect: indeed very few people could expect to be liſtened to, even by philoſophers, if they were to propoſe ſuch an innovation, though only in the language of ſcience. But this, in the courſe of ages, might be accompliſhed by the united and ſucceſſive labours of philoſophers; and I have no doubt but it would be ſo, if it were really found neceſſary. I can ſee no moral nor phyſical impoſſibility in having a language for theſe parts of phyſical and metaphyſical ſcience, as perfect as algebraical notation, and, if requiſite, as different from the common language of mankind.

But ſuch an object, however deſirable, that could not, on the moſt favourable ſuppoſition, be accompliſhed in leſs than many years, or perhaps not in a century, muſt be quite out of the queſtion in a firſt attempt. And however agreeable or uſeful it would have been to have had ſuch

a language, as a perfect inſtrument in the work propoſed, yet I truſt it is not indiſpenſable; and that the work may be carried on without it; though no doubt with greater labour, and of courſe more ſlowly.

There ſeems no reaſon to doubt, that men not having any uſe of language, but all the other ordinary faculties of human nature, as well as men who had the uſe of a perfect language, ſuited to the objects of their inveſtigation, might attend to the particular inſtances of the things that were to be conſidered and compared, and might judge of them clearly and well, ſo as to know as much of their nature, of their reſemblances, of their differences, and of all their other relations, as ever can be known by mankind. So, for aught that I can perceive, may men do, who have the uſe of ſpeech, but whoſe language, with reſpect to ſuch ſubjects, is imperfect and ambiguous.

The chief difference that I can perceive as neceſſarily reſulting from the three different

ferent ſuppoſed ſituations in point of language, is, that the perſon having the uſe of an unambiguous and perfect language could communicate his thoughts to others preciſely, and eaſily, and rapidly; that the perſon having no uſe of language could ſcarce communicate his thoughts at all, and at beſt very ſlowly and imperfectly, by his actions and his ſigns; and that the perſon having the uſe of only common and ambiguous language, would not only expreſs his thoughts imperfectly, and with difficulty, if he truſted to words alone, but often at the moſt imminent riſk, amounting in ſome caſes to almoſt a certainty, of being miſtaken or ill underſtood by thoſe to whom his diſcourſe was addreſſed, perhaps even of miſunderſtanding and perplexing himſelf.

I conceive, too, that, *cæteris paribus*, the perſon who had the uſe of the perfect language, like that of Algebra, would have great advantages in conducting his own reaſonings, even by himſelf, independently of any view to the communication of them to others; and that he would get on

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in his progreſs towards general inferences and concluſions, that is, towards philoſophical knowledge, much quicker than any perſon could do who had not the uſe of ſuch an inſtrument to aſſiſt the operations of thought.

But, the natural faculties, by which the knowledge of the particular things to be compared and judged of is acquired, being ſuppoſed uniform, or nearly ſo, in all men, I conceive, that thoſe who had no language, thoſe who had an imperfect and ambiguous one, and thoſe who had the moſt perfect language, would agree perfectly, in point of thought, as to the objects of their inquiry, whenever they attended to the particular inſtances of them. And on this principle I conceive, that, by the conſtant, or even the occaſional, reference to ſuch particular inſtances of what is meant by any of the ambiguous words or phraſes in every caſe in which they are employed, men may be made to underſtand one another perfectly, and, what is of at leaſt equal moment, may underſtand themſelves, in their reaſonings

ings on theſe ſubjects, even though they ſtill continue to uſe the common ambiguous language of mankind, which it is impoſſible, at leaſt at firſt, to reform and render preciſe. This, I preſume, is juſt what BACON had in view, when he warns us of the inſufficiency, and even of the pernicious effects, of definitions and explanations of terms, and directs us *ad inſtantias particulares recurrere, earumque ſeries et ordines:* And it is preciſely what I have endeavoured to do in all my inveſtigations.

But it is neceſſary, in the firſt place, to ſhew, that the words commonly uſed to expreſs the notions that enter into our reaſonings on the ſubjects in queſtion, are really ambiguous; *ut homines* (to uſe BACON's words) *præmoniti, adverſus ea ſe, quantum fieri poteſt, muniant*; and, in particular, that, being duly aware of the ambiguity of the words unavoidably to be employed, they may, in all their thoughts and reaſonings, attend *ſolely* to the import of the particular inſtances ſuggeſted in illuſtration of the words, and not to the various

various and ambiguous import of the words themſelves, conſidered apart from the inſtances employed in the different caſes to explain them. This mode of proceeding is indeed unpleaſant and tedious; but it is practicable: it is not near ſo difficult as to be obliged to learn and rigorouſly employ a new philoſophical language: as, for example, any one of the ſeveral new languages lately introduced, or at leaſt propoſed, and really found neceſſary in chemiſtry. In this ſcience many new notions have lately been introduced, many old aboliſhed, and many disjoined which were formerly aſſociated moſt intimately, and expreſſed by vague and otherwiſe inadequate terms. A new chemical language, therefore, was indiſpenſably neceſſary: yet ſtill I believe many good chemiſts find much difficulty in uſing any of thoſe that have been recommended, and even in underſtanding them when uſed by others.

The expedient which I employ is little if at all worſe than being obliged to read hiſtory and mathematics, with conſtant reference

ference to maps and diagrams; without the aid of which, very few people would be able to comprehend rightly, and underſtand clearly and fully, what they read: It is not, in my opinion, near ſo unpleaſant, as to be obliged to ſtudy an elegant author, in a language which we underſtand but imperfectly, with the help of a tranſlation, (like thoſe *ad uſum Delphini*), or of notes *variorum*, or, worſt of all, of a dictionary; all which helps many good ſcholars have occaſionally been glad to employ, before they were ſufficiently acquainted with the ſtyle of an author, or with the language in which he wrote, or with the manners and cuſtoms of ancient and foreign nations, or with the different ſcenes and events, to which he alluded, to be able fully to underſtand at once what they read.

As to that mode of proceeding being ſlow, and perhaps tedious, which it no doubt muſt be to a certain degree, I reckon it no diſadvantage, but, on the contrary, a real and very great advantage, in ſuch an inveſtigation as mine; the object

of which is, not amuſement or pleaſure, but inſtruction. Few or none will ever engage in it but thoſe who wiſh to be inſtructed, or, to ſpeak more accurately, who wiſh to inſtruct themſelves; and theſe ſurely cannot think any expedient too ſlow, which is evidently neceſſary, nor any one tedious which is really uſeful, for the purpoſe which they have in view. Beſides, it is a very great imperfection in the underſtanding of many perſons, that in them the train of thought is naturally and generally too rapid, and perhaps likewiſe too copious and complicated, in reſpect even of the combination of ſimultaneous conceptions, to allow them time to examine ſteadily and accurately each particular thought as it occurs; that is, to attend ſtrictly to each of them, as it comes, either in ſucceſſion, or in combination with others, and to compare them with one another, ſo as to perceive clearly their reſemblances, their differences, and their other relations.

That there are great differences in different individuals, and even in the ſame individual

individual at different times, with reſpect to the natural rapidity of the train of thought, is certain; and it may be well illuſtrated, and indeed *proved*, by the familiar obſervation, that ſome people ſpeak ſo quick, and others ſo ſlow, that ordinary men, accuſtomed to the common rate of ſpeaking, find it diſagreeable, nay difficult, to liſten to them, or to converſe with them.

Thoſe who ſpeak too ſlow are in general only tedious, and ſometimes dull; but few or none of them are abſolutely unintelligible. This, however, would almoſt certainly be the caſe with one who ſhould let his words drop from him at long intervals, like minute guns, or the very ſlow tolling of a bell. A ſucceſſion of any words, uttered ſo ſlowly, would no more be connected and rational diſcourſe, than the equally ſlow ſucceſſion of any ſimple tones would be melody or muſic, or than the very ſlow and ſucceſſive inſpection of every minute part of a great picture ſeparately would be a view of the whole of it, ſufficient to give a perſon a juſt notion of a

great landſcape, or of the whole groupe of figures in an hiſtorical picture. This plainly depends on the fleeting nature of every kind of thought, and admits of many curious and uſeful applications, which it is needleſs here to conſider.

Thoſe who ſpeak too faſt, even though they articulate perfectly, are often but very imperfectly underſtood; and ſometimes become almoſt unintelligible to ordinary perſons, whoſe thoughts come to them ſo much more ſlowly than the torrent of words which is poured upon them by too fluent ſpeakers, that they cannot overtake them. They cannot contrive, by any effort of attention, to have, in proper time, and ſucceſſion, and combination, the various thoughts which the quick ſpeakers wiſh to produce in them. This happens every day, even in too quick reading, tho' with diſtinct articulation; and though the ſentences read be the compoſition of a good author, whoſe meaning was juſt; and though every word and phraſe be well choſen, and well arranged, ſo as to expreſs fully and clearly the meaning intended,

tended, if due time had been allowed the hearers to apprehend it. But in very quick *extempore* ſpeaking, it is reaſonable to ſuppoſe, that a perſon may often not fully underſtand himſelf: certain it is, that many perſons, when they ſpeak very quick, not only ſpeak injudiciouſly, but in ſuch a manner, that their words, accurately remembered, and carefully and coolly examined afterwards, cannot be underſtood, either by themſelves or by others; not even with all the help that rules of logic and of grammar afford.

Sometimes the words, ſometimes even the actions of men, are ſuch as indicate, not merely imperfection, and obſcurity, and confuſion, but abſolute incongruity, of thought; to ſuch a degree even as to be ludicrous.——*Bulls*, I think, ſome of which are only verbal, but others truly practical blunders, come under this deſcription. They ſometimes proceed from a perſon's attention being ſo thoroughly ingroſſed by one object, that he can think of nothing elſe; nor, conſequently, perceive even the ſimpleſt and moſt obvious relations

relations of that object to others: but more frequently, I apprehend, they proceed from the very oppoſite circumſtances; too little attention, too quick thought, and an imperfect and confuſed apprehenſion of many things together; which, without more time, and ſtricter attention, can neither be properly diſtinguiſhed, nor rightly comprehended, in point of thought; nor, conſequently, can they be expreſſed in words with ſufficient clearneſs and preciſion.

If it be true, as from its being very generally aſſerted and believed I preſume it is in ſome meaſure, that the Iriſh nation excels in this kind of compoſition, for to my certain knowledge it has not acquired an abſolute monopoly of the commodity, I conceive that it is to be explained and accounted for on the ſimple principle which I am here conſidering.

To attribute it to any natural defect in the intellectual powers of a great people, would, in the firſt place, be illiberal in the higheſt degree; and, in the ſecond place,

place, would be abſurd. But I think it may reaſonably be attributed to that peculiar rapidity of thought, and that eagerneſs and impetuoſity of character and conduct, which I preſume the Iriſh themſelves will acknowledge to be juſtly their national character.

Such a peculiarity, whatever may have been its origin, whether moral and political circumſtances in diſtant ages, affecting whole tribes of men, or the accidental, but natural ſingularity of character, of one individual, or of one family, of great influence and extenſive connections, may have become general and permanent, in conſequence of the powerful influence of inſtinctive involuntary imitation in early life, and of long habit in more advanced years; which are two of the ſtrongeſt and moſt general principles in human nature. It may therefore be conſidered as an inſtance ſtrictly analogous to all other peculiarities of manner, and in ſome meaſure even of character, which are often characteriſtic, not only of individuals and of families, but of whole nations; as, for example,

example, ſedateneſs or levity, taciturnity or loquacity, ſlow or quick ſpeaking, provincial and national accents; all of which are in a great meaſure acquired, and often firmly rivetted, by the tendency to involuntary imitation, and the force of eſtabliſhed habit.

The *Bull*, in whatever nation or language it may occur, I conſider as the extreme caſe, or *ne plus ultra*, of inaccurate and imperfect thinking; on which very account it affords the beſt illuſtration of the nature and cauſes of ſuch inaccuracies and imperfections of thought, and of the means of correcting them.

If the train of thought were made ſo ſlow in any perſon, that there ſhould be time to attend to every object, and every circumſtance of relation involved in any common and complex operation of thought, (for moſt common operations of thought are complex); and if, by any expedient whatever, the perſon were made to attend duly to every one of them, either in ſimultaneous combination, or in very

very quick ſucceſſion, according to the circumſtances of different caſes, I think it would be as impoſſible for him to make a *Bull*, as to deny an axiom of geometry, or the concluſion of a good ſyllogiſm.

We hear and read of many wonderful *Bulls* of the truly practical kind, altogether independent of language, and plainly founded in thought alone; ſuch as, ſending expreſs for a phyſician to come without delay to a patient who was in the utmoſt danger, and telling the Doctor, in a poſtſcript of the letter addreſſed and actually ſent to him, not to come, as the patient was already almoſt well again; or obſerving gravely, when this ſtory was told, that it was right to add ſuch a poſtſcript, as it ſaved the ſending another expreſs to countermand the Doctor; or incloſing a thin ſixpence in a ſnuff-box, that it might not be again to ſeek when it was wanted to open the box, the lid of which was ſtiff; or realiſing HOGARTH's ingenious emblem, in one of his election-prints, by cutting away cloſe to the tree the bough on which the perſon who cut it ſat himſelf;

ſelf; which I once ſaw ſucceſsfully performed; and, for the honour of my own country, I muſt ſay that it was in Scotland, and by a Scotchman, who narrowly eſcaped breaking his neck by ſo doing; or what may fairly be reckoned the *maximum* of *Bulls*, and *inſtar omnium*, a gentleman, when his old nurſe came begging to him, harſhly refuſing her any relief, and driving her away from his door with reproaches, as having been his greateſt enemy, telling her that he was aſſured he had been a fine healthy child till ſhe got him to nurſe, when ſhe had changed him for a puny ſickly child of her own. If I am rightly informed, France has the honour of having produced this immenſe and unparalleled *Bull;* which is indeed *perfectum expletumque omnibus ſuis numeris et partibus*, and perfect of its kind.

At firſt view, it might be thought that men who could fall into ſuch abſurdities in their ſpeech or conduct had not the ordinary faculties of mankind: but this would be a great miſtake. There was probably no natural defect in their intellectual

lectual powers; nor any imperfection in their mode of uſing them, either habitually or on the occaſions ſpecified, but what it was in their own power to correct almoſt in an inſtant. No laborious effort, or what could be called patient thinking, would be requiſite for that purpoſe; nor any thing more than an eaſy degree of attention to thoſe circumſtances which ſhould have been conſidered. This ſimple expedient would inſtantly enable them to perceive, nay, would make it impoſſible for them not to perceive, not only the impropriety of their words and actions, but the incongruity and abſurdity of their firſt haſty thoughts, as clearly as Mathematicians perceive that a part is leſs than the whole. Surely a man who could not by ſuch means be made in half a minute to perceive the *Bull* he made, would be as much a monſter, and as great a curioſity, as one who could not ſee that the whole is greater than its part.

What is intuitively, as well as experimentally, certain with reſpect to the greateſt poſſible imperfections in the exerciſe of

thought, in perſons not inſane, nor deficient in the ordinary faculties of mankind, and to the eaſy and almoſt infallible means of correcting ſuch imperfections, may fairly be applied, *a fortiori*, to the ſlighter and more common imperfections of the ſame kind; which amount only to vague, weak, inconcluſive reaſoning, and too haſty and imprudent conduct. I believe they differ more in degree than in kind, and accordingly appear ſometimes to paſs into one another, by inſenſible gradations.

It was the actually obſerving ſome ſuch gradations in the courſe of my own inquiries, that ſuggeſted to me the preceding remarks and illuſtrations; particularly meeting with one inſtance, in which a Metaphyſician, reaſoning by means of vague terms, and general principles, and abſtract propoſitions, which I reckon very prepoſterous inſtruments in ſome reaſonings, and diſdaining to employ the tedious aid of particular inſtances, which I find abſolutely neceſſary helps in my reſearches, paſſed through all the gradations

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of incongruity ſo rapidly, as to bring them all into view at once; thereby plainly ſhewing how nearly they are allied.

As this caſe is very inſtructive, I mention it particularly. The perſon in whoſe argument it occurred is a man of ſuperior talents, and great erudition, and extenſive general knowledge, peculiarly well verſed in metaphyſical reſearches, and capable of, and much uſed to, cloſe and accurate reaſoning on a ſubject in which the principles are clear and well eſtabliſhed, and the terms perfectly adequate to expreſs all the requiſite notions without obſcurity or ambiguity. Knowing that he held opinions on ſome points of philoſophy that I had been ſtudying diametrically oppoſite to mine, which I thought I was able to eſtabliſh by new and deciſive proof, I allowed him (as I have done many others of the ſame way of thinking with him) to examine, at their leiſure, and repeatedly, all my arguments and illuſtrations on the points in diſpute.

I never could perceive, that he or that any other perſon conceived differently from what I did with reſpect to any one of the many particular inſtances that I employed, as illuſtrations of my meaning, and a kind of ſpecimens of the things which I wiſhed to compare: nor could I find that he ever ſuſpected me of miſrepreſenting, or even miſarranging any of thoſe inſtances or ſpecimens; or that he ever expected, in any caſe propoſed to him, the reſult to be different from what I had ſtated it. But he retained his former opinion.

In conſidering how this might come to paſs, I ſoon obſerved, that in his own diſcourſe and reaſonings, and I have no doubt that ſomehow, even in his thoughts, he employed the vague ambiguous terms which I had reprobated; that he would not make uſe of the inſtances ſuggeſted by me, nor attend to them as the ſubject of diſcuſſion and compariſon; but ſeemed to be tired and diſguſted with them at leaſt, if not provoked at the uſe which I made of them; and always recurred to the general, and what I thought the ambiguous,

guous, expreſſions commonly employed by Metaphyſicians. The conſequence neceſſarily was, that I *could* not underſtand him, and that he *would* not agree with me.

I had repeatedly declared to all thoſe to whoſe reviſion I ſubmitted my argument, as knowing that they were adverſe to my concluſions, that if they would favour me with their objections in writing, I ſhould conſider them with the ſtricteſt attention; and that if I found any of them valid, or even ſo puzzling, or of ſuch a nature, that I could not eaſily anſwer them, ſo as to convert them into a ſort of illuſtration of my own reaſoning, I ſhould give up my argument as abſurd, and chearfully acknowledge my obligations to the perſon who ſet me right, and his ſuperiority in reaſoning; and ſhould commit my lucubrations to the flames, as not only uſeleſs in ſcience, but diſgraceful to myſelf.

As the beſt teſt I could give them of my *bona fides* in this offer, I engaged to publiſh,

publiſh, along with my Eſſay, any objections to which they would ſet their names, and which they would allow me to publiſh; and as the correſponding teſt of their ſincerity and confidence in their own ſyſtems and reaſonings, I entreated them not to give me any objections but ſuch as they could openly avow, and allow me to make that uſe of.

In conſequence of this offer on my part, many objections and anſwers to my Eſſay, were propoſed to me; ſome of them of a very wonderful kind indeed, and abundantly puzzling, or, as I think, irrefragable, if I had had no better inſtruments for the purpoſe than the ambiguous words and vague principles that long have been, and ſtill continue in general uſe among Metaphyſicians. But on my explaining to the ingenious authors of them, what kind of arguments, and more particularly what kind of illuſtrations and inſtances, *earumque ſeries et ordines*, I ſhould ſtate in reply to their objections, which I could by no means think valid; though none of them retracted their objections, or owned that they were erroneous

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and unreaſonable; yet I found that none of them choſe to avow his objections openly, by allowing me to publiſh them with his name ſubjoined to them; and none but one of them would allow me to publiſh his argument even without his name; for this offer I made to them all at laſt, as I was truly deſirous to have the advantage of ſome of the many admirable illuſtrations which their objections afforded.

From this conduct, which, with only one exception, was uniform on their part, I could not help inferring, that whatever diſlike and diſtruſt they might feel of my ſpeculations, and whatever confidence they might have in their own ſyſtems, they had but little confidence in the objections they offered againſt my reaſonings.

That one exception, however, produced the ſtrong illuſtration in queſtion. The Metaphyſician who had favoured me with ſo many unavailing remarks on my argument, both *viva voce* and in writing,

in different ſtages of its progreſs, got one peruſal more of it when it was printed off; and, after conſidering it maturely, at leaſt after having it in his poſſeſſion for ſeveral months, returned it to me, with his final judgement and remarks on it, and gave me leave to publiſh them, if I choſe to do ſo. This he did, knowing perfectly what reaſons I had to regard my argument as valid and concluſive, both in point of mathematical reaſoning and phyſical obſervation, experiment, and induction; knowing alſo, that my reaſonings and inferences were given as a teſt of the *bona fides*, as well as of the ſoundneſs of the philoſophy, of thoſe whoſe doctrine he maintained; on which laſt point he had very freely and kindly expreſſed to me his opinion.

I found theſe laſt objections of the ſame kind with thoſe I had got from him before; that is, depending on vague general principles, and ambiguous terms, with very little or no attention to particular inſtances, and to the diſtinctions which they enable us, and force us to obſerve; and which the

the uſe of general ambiguous expreſſions enables us and forces us to confound. I even thought theſe laſt objections in ſome reſpects leſs intelligible, if poſſible, than any I had got from him before.

The firſt paragraph of his final remarks, though the expreſſion of it was vague, eſpecially with reſpect to the unexplained and unlimited application of the term *Cauſe*, I was enabled, by many different circumſtances, and much experience, to underſtand ſufficiently to perceive with certainty, that it was no objection, and that it ſcarce bore any relation to any thing that I had advanced. But of the ſecond paragraph I could not underſtand even one ſentence, though it contained many things that, from their grammatical ſtructure, looked very like propoſitions, and were expreſſed in five or ſix ſentences; all of which ſeemed to relate to a ſubject that had long been familiar to my thoughts, and ſeemed to be intended as objections, or as a prelude to objections, to my own obſervations and reaſonings. Moſt other parts of the objections given

me to publiſh appeared to me to have either the ſame or ſtill greater imperfections, and to be altogether unfit for publication, as being not in the leaſt likely either to promote the intereſts of ſcience, or to do much credit to their ingenious and very metaphyſical author.

Convinced of this, and ſenſible of the peculiar difficulty and delicacy of my own ſituation, I tried once more to call the author's attention to them, and to the particular inſtances on which my reaſonings depended, and to which alone all objections to them, and indeed all reaſonings on theſe ſubjects, ought to relate. I hoped he would be prevailed on to reaſon on my principles, or rather on BACON's, whoſe plan I had adopted; and I truſted, that, if he did ſo, whether he altered his opinion with reſpect to my argument, and the general point at iſſue, or not, he would ſee the expediency of either withdrawing his objections as invalid, or at leaſt not allowing me to publiſh them; as ſeveral perſons, not his inferiors either in talents or knowledge, and of the ſame perſuaſion

perſuaſion with him in metaphyſics, had, on mature conſideration, after the ſame kind of warning, done with reſpect to theirs.

In this expectation I was baffled as before; and, I believe, by the ſame means.

I made one effort more to effect the ſame purpoſe. I intreated him, and, as it appears, prevailed on him, to ſubmit his objections to the reviſion of two perſons whom I named to him; two of the ableſt men, and beſt ſcholars, and beſt Mathematicians, and of the moſt extenſive acquaintance with various branches of ſcience, that I had ever known; both of them were his own intimate friends; both of them were thoroughly acquainted with my lucubrations, and my mode of reaſoning, by reading my Eſſay, as well as by frequent converſations with me about it: both of them were familiar with the inſtances and illuſtrations, and other means, that I employed to correct the ambiguities, or ſuperſede the uſe, of common language in my diſcuſſions; and had felt,

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or ſeemed to feel, the application and the force of them: one of the two, a Metaphyſician as well as a Mathematician, and a great admirer of MR HUME and of his philoſophy, (of which he ſeemed either to have forgotten, or never known the greater part, and not clearly to have underſtood the reſt, which is a very common caſe with the admirers of it), had favoured me with many obſervations on my argument, in *viva voce* converſation; and had, in the courſe of two years, given me in writing two different ſets of objections, chiefly mathematical objections, to it; the firſt of which ſets of objections, as he aſſured me beforehand, was to contain a complete *demonſtration* of the error of my reaſoning: yet ſomehow it has happened, that after hearing and maturely conſidering my anſwers to his own objections, he has not choſen that theſe ſhould be publiſhed, either with or without his name.

The other perſon, too, had favoured me with many *viva voce* remarks on my Eſſay; and once gave me in writing a ſet of objections to it; not indeed as his own ſe-

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rious opinion, but as a ſpecimen of what he thought might be urged againſt my argument, and would be moſt difficult for me to anſwer. I found no difficulty in anſwering them all, on the ſame plain principles on which I had uniformly proceeded: and he well knew, and, as I underſtood him, had acquieſced in my anſwers.

Both theſe perſons muſt have known perfectly for what purpoſe, and at whoſe deſire, the other's objections were put into their hands; and of courſe what would be the inevitable conſequence, if they ſhould expreſs their approbation of them as valid in point of reaſoning, and fit for public view. On this account, independently of the perfect conviction I have of their candour, I was ſure they would never expreſs any approbation of the objections which they did not truly feel; well knowing, as they muſt have done, that ſuch proceeding would have been, not an unmeaning, but a fallacious compliment, and a moſt unfriendly action. I truſted that they would have perceived,

and

and would have made the author of the objections perceive, that however acute and ingenious his compoſition might be in point of metaphyſical ſubtlety, it bore ſcarce any relation, and certainly could be no anſwer or objection, to my mathematical reaſoning; nor even to my induction from the eaſieſt experiments in phyſics, and the moſt familiar obſervations on the conduct of mankind.

Great, therefore, was my aſtoniſhment, about three months afterwards, to receive the ſame objections, very nearly *in ſtatu quo*, with written teſtimonials of the approbation of the two perſons to whoſe judgement they had been ſubmitted. Both theſe teſtimonials I preſerve with care, as literary curioſities: the one of the Metaphyſico-mathematico-philoſopher is in the ſtrongeſt and moſt general terms; the one from the ſimple Mathematician is more particular and more guarded; but is in ſubſtance the ſame with the other.

The objections, double-fortified with theſe

theſe teſtimonials, were finally ſent to me in ſuch a manner as effectually and for ever to preclude all further attempts at elucidation on the ſubject of them with the three perſons concerned.

There was no more to be *ſaid*.

The firſt thing to be *done* was, to aſcertain whether it was from any defect in the compoſition in queſtion, or only from a defect in my own intellects, that I did not ſee the force and merit of it; whether it was only I that could not underſtand it, or it that could not be underſtood. Theſe two things I have long learned to conſider as moſt eſſentially different. I cannot underſtand by far the greater part of the writings of ARCHIMEDES and of NEWTON; and I am ſorry for it, as I have no doubt that the defect is entirely mine, namely, the want of ſufficient mathematical knowledge: for I am well convinced, that all their writings may be underſtood; and that they deſerve to be ſo, both on account of the ingenuity of the

reaſonings and the importance of the diſcoveries which they contain.

I underſtand but very little of the medical ſyſtem of GALEN, and ſtill leſs of the writings of PARACELSUS; and not much more of the phyſics and the metaphyſics of ARISTOTLE and of MR HUME; and I am not in the leaſt ſorry for it: nor do I wiſh to underſtand any more of them; for, judging of the whole from the part which I do underſtand, I preſume with confidence, that if it were all intelligible, it would not be worth underſtanding; for this, I am ſure, is the caſe with the part which I do underſtand; while, from finding the directly contrary quality in the ſpecimens of the writings of ARCHIMEDES and NEWTON which I do underſtand, I unavoidably preſume the fame with reſpect to the great bulk of them which I do not underſtand.

To apply theſe general principles to the objections in queſtion, was eaſy: in truth, I had almoſt involuntarily done it from the

the moment I firſt ſaw them; and finding thoſe parts of them which I underſtood either erroneous in point of obſervation, or inconcluſive in point of reaſoning, or confuſed and ambiguous in their meaning, or all three of theſe things together, I neceſſarily judged, that the more obſcure parts of them, which I could not underſtand, either could not be underſtood, or at beſt did not deſerve to be ſtudied.

Not chooſing, however, to truſt abſolutely to my own judgement, on a point of ſuch conſequence, I had recourſe to the judgement of ſeveral of the moſt judicious, and acute, and beſt informed perſons of my acquaintance, whom I prevailed on to examine ſtrictly thoſe very obſcure paſſages of the objections, and to tell me what they thought of them, how they underſtood them, and whether they underſtood them or not. The reſult of theſe examinations was, to confirm in all reſpects the opinion of them which I had formed before.

Obliged as I was, by my promiſe, to publiſh thoſe objections, if I did not think them valid, and by my ſituation, to ſtate very fully my anſwers to them, if they were publiſhed. I ſet about inveſtigating the meaning of thoſe dark paſſages, and tracing all the connections in the train of thought in them, with the moſt rigid accuracy. In the execution of this taſk, by far the moſt irkſome I ever did or ever will undertake in the purſuits of ſcience, I at laſt perceived, that the author of them, beginning with the common ambiguity in all reaſonings about *Cauſes*, which I had been at much pains to point out and to correct, proceeded ſo rapidly to greater and greater degrees of obſcurity and ambiguity, that in his ſecond page I loſt ſight of his meaning completely: *Rebus nox abſtulit atra colorem.*

On trying again and again to explore that dark paſſage, I had the good fortune, in a twelvemonth, or little more, to perceive for certain, that it could not be underſtood: the compoſition, from real incongruity

congruity of thought, amounting to a genuine *Bull*, as truly as the unlucky Frenchman's indignation at the old woman for changing him at nurſe. Many other paſſages I then ſaw clearly to be approximations to the ſame kind of incongruity, and was enabled to anſwer them accordingly.

The objections, and the anſwers to them, ſhewing ſome of thoſe incongruities, are printed in the Appendix to the Eſſay, to which they relate; and which muſt be read before they can be underſtood. Every perſon then may judge for himſelf, whether the account here given of them be exaggerated, or in any way miſrepreſented; and will, I truſt, on mature conſideration and trial, agree with me in thinking, that this real caſe affords an illuſtration, ſtronger, if poſſible, and certainly more in point, than any of the imaginary extreme caſes that I had contrived, to ſhew the nature and cauſes of ſome kinds of obſcurity and perplexity of thought, and the remedies or means for

for correcting them. Such perſons may judge, whether it would have been *poſſible* to have thought and argued in the ſame way, if, either inſtead of vague, ambiguous, general terms, or along with theſe, and in explanation of them, particular inſtances, ſuch as BACON recommends, and I ſuggeſt, had been duly employed.

Yet thoſe ambiguous expreſſions and reaſonings were ſatisfactory, not only to the author of them, but to two other men, of undoubted candour, and uncommon talents, and great knowledge, and much accuſtomed to, and very capable of, the acuteſt and ſtricteſt reaſonings on different ſubjects, in which the notions to be reaſoned about are clear and preciſe, and the terms expreſſing them diſtinct and accurate. I have no doubt but that many perſons of good ſenſe, even after this ample warning, will read the paragraph and the objections in queſtion, without ſuſpecting their defects; and will think them as good, or at leaſt as plauſible, as any

any common metaphyſical argument, ſuch as thoſe of MR HUME and DR PRIESTLY, on the doctrine of Cauſes. But let them try them by the teſt of particular inſtances; let them endeavour even to find ſuch inſtances of the general propoſitions which they admit ſo eaſily, and which in truth ſave them the trouble of thinking, and eſpecially the ſore trouble of dividing, and as it were untwiſting their own perplexed maſs of thought, and the illuſion will be at an end.

It is common to ſay, that very quick lively people, who often ſpeak too faſt, and of courſe ſometimes injudiciouſly, ſpeak without thinking, or before they think; but this is a mere hyperbole, and taken literally would be abſurd and incredible. Speaking implies thought, concomitant, or preceding, or both; however inaccurate ſuch thought may be. All we ought to underſtand by thoſe expreſſions is, that ſuch people think too rapidly, and conſequently in many caſes erroneouſly and confuſedly, and that they ſpeak almoſt

moſt as faſt, and to as little purpoſe, as they think.

The ſame indeed is true of very quick writing, (I do not mean penmanſhip, but compoſition), correſponding to very quick thinking; though writing be neceſſarily much ſlower than ſpeaking, and have a ſtrong tendency to make the thinking connected with it proportionably ſlow. Yet all men who have written much, *and well*, (excepting only SHAKESPEARE, who it is ſaid never blotted), have been obliged to correct a great deal; have altered many a ſentence which, on cool and ſlow examination, they found obſcure, or confuſed, or erroneous, or unintelligible; and have blotted many as too bad even to be mended, and have written them anew. And I preſume any candid admirer of SHAKESPEARE will own, that it would have implied no diminution of his well-merited fame, nor been any real loſs to his readers, if he too had blotted and corrected a good deal.

On the ſubject of my inquiry, there is yet

yet another danger and difficulty, very intimately connected with this of too rapid thought, and equally requiring attention and remedy, becauſe it is equally inconſiſtent with that accurate and impartial attention to various circumſtances of relation, and that diſtinct conception and equal conſideration of them all, which are abſolutely neceſſary for my purpoſe.

The object and plan of my inveſtigation is, to aſcertain, by ſtrict attention, the differences, hitherto in a great meaſure overlooked, among many things, which have perhaps ſomewhat of a common nature, and which at leaſt have a great and obvious reſemblance. Now it happens unluckily, unluckily I mean for this inquiry, though no doubt happily for mankind in general, as is the caſe with every other principle of human reaſon, and I believe fortunately even for thoſe who engage in the cultivation of moſt parts of ſcience, that our attention is given, firſt, and moſt naturally, to any points of reſemblance among different things, with little regard to the points of

difference among them, even though the latter be much greater and more numerous, as well as more important.

To this principle we may fairly refer the well-known fact, that we are all ſo much ſtruck with the accidental or the family likeneſs among different individuals, when ſeen ſeparately, to ſuch a degree even as ſometimes to fall into very ridiculous errors, by miſtaking one perſon for another; though perhaps, when the two perſons were ſeen together, ſuch a miſtake would be thought impoſſible; the reſemblance between them being evidently ſlight and imperfect, and the differences undeniably ſtrong and obvious.

This principle, of an almoſt inſtinctive attention to reſemblances rather than to differences, and a peculiar pleaſure found in contemplating the former and not the latter, is, I believe, in a greater or leſs degree, nearly univerſal among mankind: but it is certainly much ſtronger in ſome than in others. It is generally ſtrongeſt in men of quick and lively parts, and of warm

warm imaginations. To poetic fancy it is almoſt eſſential: for all the beautiful, and ſublime, and pathetic imagery, and all the ſtriking alluſions, which poetry diſplays, depend ultimately on the quick perception of various reſemblances, which eſcape common obſervation, and, if they be not altogether viſionary, at leaſt are faint and diſtant. But it is not confined to poetry, nor to poets: in the common intercourſe of life, and even in the purſuits of ſcience, (in which ſome degree of it is highly uſeful), we can often ſee a remarkable exceſs of it in ſome individuals. *Ingenia ſublimia, et diſcurſiva, etiam tenuiſſimas et catholicas rerum ſimilitudines et agnoſcunt et componunt*, ſays BACON, whoſe obſervations, both on this tendency and on its oppoſite, are judicious and profound. *Nov. Org. lib.* 1. 55.

That very imperfection and ambiguity of common language on the ſubject of my inquiry, to which I here chiefly alude, is undoubtedly the reſult of this tendency, in philoſophers as well as in the bulk of mankind, to dwell with eagerneſs

and pleaſure on reſemblances, though ſlight at beſt, if not imaginary, like the ſuppoſed analogies between things material and things intellectual, and to overlook even the moſt obvious differences. If mankind in general had not found, or fancied, ſome reſemblance among all different kinds of cauſes, agents, or principles of change, theſe never would have been expreſſed in any language, as in fact they have been in all, by ambiguous words and phraſes: and if philoſophers in general had not perceived and acknowledged ſuch reſemblances, and dwelt too much on them, regardleſs of the more important differences among the things in queſtion, they would not have been content with the common language on ſuch ſubjects; nor would they have uſed it without many needful additions and corrections. They would have done, from the firſt dawnings of ſcience, what Mathematicians muſt have done from the very beginning in geometry, and what phyſicians are at preſent endeavouring to do in medicine, and certainly will accompliſh in proceſs of time, with reſpect to the diſtinctions

tinctions and nomenclature of diſeaſes:—they would have contrived and fixed a language of their own, preciſe in its import, and adequate to their purpoſe.

Now all theſe evils and dangers;—too great quickneſs of thought, precluding due conſideration of all the circumſtances that ought to be conſidered;—too great diſpoſition to attend to reſemblances, and to overlook differences;—the various points of reſemblance and analogy among the things to be examined;—and even the illuſion neceſſarily reſulting from the ambiguity of the terms commonly uſed to expreſs them, muſt be obviated, in one way or another, before we can have even a reaſonable chance of ſucceſs in the propoſed inquiry.

Some of them plainly could not, and I doubt much whether any of them could be effectually obviated, by any definitions or explanations of the terms employed: for, in the firſt place, every ſuch explanation and term, as relating to a thing not barely conceived, and independent of any real

real exiſtence, like the defineable notions of geometry, but denoting a thing and relation which is underſtood really to exiſt independently of our conceptions, partakes ſo much of the nature of an axiom, or *petitio principii*, that it could not rationally be admitted without previouſly undergoing a rigorous examination, preciſely of that kind which I propoſe to begin with. And, at any rate, definitions, as neceſſarily conſiſting of words, moſt of which are ambiguous, would not remove, but rather increaſe and multiply, our difficulties; by giving us at leaſt two or three, and ſometimes perhaps ten or a dozen, ambiguous words, inſtead of one; and poſſibly a falſe principle to boot.

But all thoſe inconveniences may, I think, be in a great meaſure obviated by that kind of illuſtration, and that conſtant, or very frequent, reference to the particular inſtances meant, which I propoſe to employ.

This ſort of reference and illuſtration, in the firſt place, either precludes, or immediately

mediately corrects and diſpels, the illuſion of vague and ambiguous terms. In the ſecond place, it peculiarly, and almoſt irreſiſtibly, calls our attention to the differences as well as the reſemblances of the things to be examined; for the moſt diſtinct and ſtriking inſtances of ſuch differences will naturally be ſelected, and placed in the ſtrongeſt light: ſo that in this reſpect it comes as near as the very different nature of things intellectual and things material will permit, to the exhibition of well choſen and well arranged ſpecimens in natural hiſtory, or of well conducted experiments in natural philoſophy; the importance of which exhibitions in theſe two branches of ſcience can require neither proof nor illuſtration. And, in the laſt place, it effectually retards, and for a ſhort time forcibly arreſts, that train of thought which it was uſual, and eaſy, and pleaſant to indulge; the too great rapidity of which prevented that attention to many circumſtances, and that rigorous examination and compariſon of different things and relations, which are abſolutely

abſolutely neceſſary, and almoſt all that is neceſſary, for the purpoſe in view.

The quickneſs of thought is proverbial; and with good reaſon. Great quickneſs of it is by no means inconſiſtent with perfect accuracy and juſtneſs of it in certain caſes; as appears by the almoſt inſtantaneous words and actions of many perſons, which were characteriſtic of profound thought, and diſtinct recollection, and ſound judgement, and fair and nice compariſon of many different things. It cannot reaſonably be doubted, that in ſome perſons, on particular occaſions, and on certain ſubjects, even a preternaturally increaſed rapidity of the train of thought may be of advantage, by bringing to the perſon, in a ſhort time, many more thoughts than uſual, not only in ſucceſſion, but in combination, or rather ſimultaneous exiſtence, alſo; without, however, preventing him from attending ſufficiently to each of them.

It may even happen, that while the train of thought is greatly quickened, the energy

energy or force of it ſhall be at the ſame time much increaſed; to ſuch a degree even, that, with little or no voluntary effort, the moſt eager and effectual attention ſhall be given to every part of it; juſt as would happen in caſe of ſudden and violent bodily pain, or of a loud peal of thunder, or very bright flaſh of lightning. In theſe circumſtances, a perſon may judge and reaſon better, tho' more rapidly, than he could have done, however ſlowly, in an hour of languor, when he was dozing, or dreaming, over his own thoughts.

This advantage of unuſually intenſe and rapid thought will, I preſume, be experienced chiefly by perſons who are naturally dull and ſlow in thinking.

It is well known, that the train of thought may be greatly quickened by various cauſes, both phyſical and moral; for example, by various paſſions, ſuch as anger, love, jealouſy; by very eager, though voluntary exertions; by bodily exerciſe, by wine, by madneſs, and many other diſeaſes, eſpecially of the febrile

kind, with ſome degree of delirium, or tendency to it.

" Trifles light as air are to the jealous
" confirmations ſtrong, as proofs of holy
" writ."

On the ſpur of the occaſion, as, for example, in circumſtances of urgent neceſſity, or inſtant danger, or in a keen reply in a debate in a popular aſſembly, many men have *ſaid* or *done*, equally ſhowing that they *thought*, things, of which, from the general tenor of their words and actions, they could not have been ſuppoſed capable; and of which very probably, in other circumſtances, they were not capable.

Si Natura negat, facit Indignatio verſum, may have been truly ſaid on many occaſions; and Love, it is well known, has made ſome good poets, and bad ones innumerable, in all ages and nations: but however bad they may have been, they have contrived to make verſes, and to find rhimes, and collect images and alluſions; which,

which, without the aid of that inſpiring paſſion, it is not likely that they ever could have done.

I do not believe much more than half of what is ſaid of the inſpiration of wine: it is certain, however, that ſome ſlow dull people are quickened and enlivened, and made entertaining at leaſt, if not even inſtructive companions, by what might juſtly be reckoned ſome exceſs in the uſe of it. But this effect of it is by no means conſtant, even in perſons of that deſcription; and in thoſe of an oppoſite conſtitution of mind and body, the bad effects of it on the moſt valuable powers of thought are great and conſtant; ſo as ſoon to bring ſuch perſons to a ſtate bordering on temporary idiotiſm, or madneſs.

Though much has been ſaid, and with ſome truth, of the good effects of wine in producing rapidity and vivacity of thought, it has ſcarce ever been pretended that it favoured the exerciſe of diſcrimination and judgement. The only per-

ſons in whom it has ever been ſuppoſed not to have the very oppoſite effects, are ſome gentlemen of the Faculty. The ignorant vulgar would think, *a priori*, that, *cæteris paribus*, a phyſician who was ſober would attend more accurately to the caſe of his patient, and compare and diſtinguiſh all circumſtances better, and judge more ſoundly, and preſcribe more rationally, than he could do when he was drunk. But ſome phyſicians, who ſhould be ſuppoſed to know themſelves beſt, and who certainly muſt have known how they acquitted themſelves in thoſe different ſituations, have boaſted that they preſcribed as well drunk as ſober. In this they could not be miſtaken; for, whether we conſider the matter phyſically or logically, their boaſt amounts preciſely to this, That they preſcribed no better when they were ſober than they did when they were drunk; which is undoubtedly a noble accompliſhment; but it is not ſurely either wonderful or rare. I ſhould gueſs, that it might be found in all phyſicians (to ſay nothing of the other limbs of the Faculty) who think as little what they are doing when ſober,

ſober, as they do, or might do, when drunk: and though I can by no means admit that ſuch perſons conſtitute the majority of the profeſſion, yet it muſt be owned, that they form at leaſt a very reſpectable minority. —— Their patients, however, who of courſe would take their word for any thing they ſaid, eſpecially for any thing relating to their own profeſſion, and their own ſkill, probably had not rightly underſtood their phraſeology on this point; and might either never diſcover their miſtake, or not till it was too late.

With only this one exception, in favour of my own profeſſion, and with this logical explanation of it, I think we may ſafely hold, that, within any reaſonable limits, ſlowneſs of thought is favourable to diſcrimination, and compariſon, and judgement, and to the perception of various relations, eſpecially of ſuch as are complicated and remote.

Thoſe who are acquainted with the game of Cheſs can need no other, nor find

find a better, illuſtration of this important principle of thought and reaſoning, than what that ingenious and pleaſing, but laborious exerciſe, of thought, affords.

It is almoſt impoſſible to ſpeak of it accurately, either in common or in philoſophical language; for it has, as indeed it abſolutely requires, a peculiar technical language of its own. But thoſe who know any thing of the game will underſtand me ſufficiently, when I ſay, that the primary laws of Cheſs are arbitrary; but the reſult in point of new or occaſional relation, or influence of the pieces on one another, and the conſequent expediency, or in ſome caſes the abſolute neceſſity, of a particular *move* in a given ſtate of the game, is as much a matter of neceſſary conſequence, and is by good Cheſs players as clearly perceived to be ſo, as any propoſition in EUCLID's Elements, or NEWTON's *Principia*. The primary laws of the game correſpond, in this kind of reaſoning, to the axioms of geometry, and to the ultimate laws of phyſics, as in mechanics

mechanics and in optics; the ſtate of the game, after any *move*, correſponds to the hypotheſis, or caſe put, in demonſtrative reaſoning; the various indefeaſible relations, or influences conſequent upon any move or ſtate of the game, correſpond to the neceſſary relations, or conſequences, which men of ſcience can deduce from the laws of Nature, or the axioms of Geometry, conſidered as the *major* propoſitions, and the ſeveral caſes put conſidered as the *minor* propoſitions of juſt ſyllogiſms. About theſe, among men of competent judgement and knowledge, who will fairly attend to them, there can be no difference of opinion. But without ſuch fair and deliberate attention, many, even of the moſt obvious and moſt immediate of them, will be overlooked by one, or perhaps by both, of the perſons playing.

The number of even immediate relations or influences is often ſo great, that ordinary players do not perceive, that is, do not attend to, them all; nor can they do ſo without ſtrict and diſtinct examination of many things, and many relations, either

either in ſucceſſion or in combination. Now, this proceſs of thought requires ſome time; and when ſufficient time is taken for it, and when the attention is by any means called to the ſeveral proper objects, the reſult is uniform in every perſon.

The number of more remote relations, that is, ſuch as after two or three *moves* will be immediate, and will have direct influence, is almoſt infinite, and far beyond the foreſight of any ordinary perſon, even though well accuſtomed to the game. Yet much depends on foreſeeing and being prepared for ſuch remote, and (in one reſpect) contingent influences, on different ſuppoſitions; and much is done in this reſpect by every good player.

On theſe occaſions, as on many in real life, the train of thought is often ſo quick as to baffle all calculation: but quick as it is, ſome time is requiſite for it; and if this were much diminiſhed, it could not be performed at all, or at leaſt not to any good purpoſe. On the other hand, by taking

king more time than uſual, a very indifferent player will be able to perceive, and to do, what would have eſcaped a good one, who beſtowed very little time in conſidering the ſtate of the game. On this principle, I conceive that an ordinary player might eaſily ſee, and do, in two or three minutes, what PHILLIDOR himſelf could not do in half a ſecond. I conceive, too, that if any two perſons were to attempt to play at Cheſs as faſt as they could move the *pieces*, they would ſoon find it impracticable: they could not accompliſh even the moſt eaſy operations of thought requiſite for the game. All judgement or ſkill would be confounded: no regular plan (correſponding to a train of reaſoning in ſcience) could ever be accompliſhed; nay, not even formed; the beſt players would overlook numberleſs advantages, and would run headlong into as many dangers. They would probably make many *falſe moves*; that is, *moves* contrary to the fundamental principles or rules of the game; which rules, though purely arbitrary in their firſt eſtabliſhment, are, with reſpect to all who play at

Chefs, as facred and indefeafible as the natural laws of human thought. *Falfe moves* at Chefs, therefore, correfpond very exactly to abfurdities in logic and in geometry, to difcoveries in metaphyfics, and to *Bulls* in the common language and bufinefs of mankind. And if any perfon, either from obftinacy *will not*, or from want of attention, and too rapid thought, *cannot* obferve thofe rules, and will perfift in violating them, however great his talents may be in every refpect, moft certainly he can never play at Chefs.

All thefe obfervations and reafonings, which are fo well illuftrated and proved, and almoft rendered vifible and tangible by the inftance of that game of thought, are, I conceive, ftrictly applicable to the exercife of thought in the purfuits of fcience.

Admitting, what I believe is well afcertained as a matter of fact, that a Mathematician of fuperior genius and knowledge may perceive, almoft intuitively, the truth of fome very abftrufe and complex propo-

propoſitions, and that he may very quickly ſee the demonſtration of them; which it would be a work of great labour, and long time, to impart and explain to ordinary men; yet I believe the converſe of the propoſition is much more frequently found true; I mean, that men of ordinary talents, by labour, and time, and patient thinking, find out many propoſitions and demonſtrations, which would eſcape the greateſt Mathematicians, if they ſhould not take time to think of them. And even when ſuch propoſitions are diſcovered, whether by the tranſient efforts of ſuperior genius, or by a kind of accident, or by deliberate patient thinking, they cannot be communicated to ordinary men, but by that peculiar proceſs of thought which we call Demonſtration; which is certainly a very ſlow, and to many people appears a very tedious, operation of thought. Both the ſlowneſs or ſeeming tedioufneſs of it, and the great advantage, or rather the ſupreme authority of it, in point of validity, depend chiefly on this circumſtance, that, by various helps and contrivances, the atten-

tion is called, pointedly and irreſiſtibly, to each ſeveral ſtep or link of the neceſſary relation between the propoſition to be proved and things already known.

The capacity and the habit of this ſlow operation of thought, with due attention to every thought as it occurs, either ſingly, or in ſucceſſion, or in combination with others, is eſſential, not only to mathematical, but to ſtrict philoſophical reaſoning: but in many parts of philoſophy, eſpecially in the philoſophy of mind, it has been much neglected; while by far too great attention has been given to every circumſtance of analogy.

But though the capacity and the actual exerciſe of that ſlow proceſs of thought be eſſential, it is not the only thing that is eſſential to philoſophical inveſtigations: nor was *patient thinking* NEWTON's only merit, as he too modeſtly ſaid of himſelf. Many a very ſtupid fellow muſt have thought as ſlowly, and as patiently, and as long, as ever he did; but yet not to equally good purpoſe. He certainly poſ-

ſeſſed

ſeſſed great quickneſs and comprehenſiveneſs, as well as patience and command of thought. And I believe ſuch quickneſs and comprehenſiveneſs of thought, with ſuch perfect command of it, that it can be exerciſed as ſlowly and patiently, or as keenly and rapidly, as different occaſions may require, is one eſſential part of that rare combination of talents which conſtitutes true mathematical and philoſophical genius.

Probably ſome rude conception of the importance, and perhaps ſome actual experience of the advantages, of theſe different conditions of the train of thought, may have given riſe to the practice, common among ſeveral ancient nations, of conſulting *twice* on their moſt important concerns; eſpecially thoſe of peace and war; firſt when drunk, and again when ſober.

TACITUS, who mentions the fact very particularly with reſpect to the ancient German nations, whoſe manners and cuſtoms he ſeems to have been well informed

ed of, gives but a confuſed and imperfect account of the reaſon and purpoſe of this cuſtom. I ſuſpect indeed that he had not rightly underſtood it himſelf; for he does not expreſs himſelf concerning it with his uſual preciſion, and clear ſtrong ſenſe: to me he appears even to contradict himſelf a little, in the account he gives of it.

Deliberant, dum fingere neſciunt :—conſtituunt dum errare non poſſunt.——The latter ſentiment is undoubtedly right: the former, if it be truth, certainly is not the whole truth. But I rather think that TACITUS had miſtaken the purpoſe and the effect of the firſt conſultation.

The ancient Germans were not cunning nor deceitful; and if they had been ſo, they would no more have got drunk together at a council of ſtate, than the *Corps Diplomatique* would do in London, or the Council of Ten at Venice; or if, by any accident, they had done ſo once, they ſurely would not have repeated it, nor made it an eſtabliſhed cuſtom. *Gens non aſtuta nec callida*

callida aperit adhuc ſecreta pectoris, licentia loci. Ergo detecta et nuda omnium mens poſtera die retractatur. But what he had ſaid juſt before appears to me a much fairer and more complete account of the matter: *De pace denique ac bello in conviviis conſultant: tanquam nullo magis tempore aut ad ſimplices cogitationes pateat animus, aut ad magnas inculeſcat.*

This laſt, I preſume, was the chief circumſtance of advantage which the honeſt Germans had in view in their firſt ſitting. They had certainly found that wine inſpired them with invention, and boldneſs, and enterpriſe; and gave them a degree of quickneſs, and vivacity, and ardour of thought, which Nature had denied them.

Their ſober meeting next day, not only enabled them, but almoſt forced them, to examine anew, ſlowly and coolly, their firſt ardent and rapid thoughts, and to conſider them rigorouſly in all their circumſtances and relations. Thus they contrived, in ſome meaſure, to unite the advantages

vantages of quick and ardent with thoſe of ſlow and patient thinking. This was much to the credit of their metaphyſical knowledge: it ſhewed great attention to their own thoughts in different circumſtances, and accurate obſervation of thoſe of others, as indicated by their words and actions; and it may fairly be regarded as a good proof and example of the advantages which even a rude and ignorant people may derive from the ſtudy of the laws of human thought.

Such being the advantages, and, in many caſes, the indiſpenſable neceſſity, of *ſlow* and *patient* thinking for good reaſoning, the attempt to produce it almoſt forcibly, on a ſubject of very abſtruſe ſpeculation, in which the want of it has been ſeverely felt, and has in a manner fruſtrated the labours of many great philoſophers, will not, I hope, be thought improper; though it muſt be done by means in ſome reſpects unpleaſant, and which in any ſubject of elegant literature, or in any work addreſſed to the imagination or to the

the paſſions of men, would be diſguſting and inſupportable.

Philoſophy boaſts not, like Poetry and Eloquence, to " whirl the throbbing heart along;" nor leads ſhe her votaries through enchanted regions, " while at each ſtep imagination burns." She rather invites them patiently to explore the dreary mine, whoſe treaſures will ſoon reward their toil; and bids them boldly try the mountain's ſteep aſcent, whoſe ſummit, hid in clouds, they muſt not hope to reach, but where every ſtep they mount extends their view of the order and beauty of nature, and removes them farther " *vulgari tumultu, hominumque curis.*"

I am perfectly aware of an objection that may be made to my plan of inveſtigating the nature of the different kinds of cauſes or principles of change, by comparing them with one another, and obſerving wherein they agree, and wherein they differ; which objection, if it were valid, would be abſolutely fatal to my inquiry. I allude to the opinion, which, with va-

rious modifications, hath been taught by many philoſophers, inculcated and adorned by poets, and, as it is thought, in ſome meaſure admitted by mankind in general, That every change which we obſerve proceeds, (as many of them unqueſtionably do), either immediately or ultimately, from the agency of ſome living Being, perhaps from the immediate operation of the Supreme Being himſelf.

VIRGIL ſeems to have been peculiarly fond of the latter opinion, and has either expreſſed it, or alluded to it, repeatedly, and in a very beautiful manner; as, for example, in the following paſſages.

Ab Jove principium, Muſæ, Jovis omnia plena.

——————— *Deum namque ire per omnis*
Terraſque, tractuſque maris, cœlumque profundum.
Hinc pecudes, armenta, viros, genus omne ferarum,
Quemque ſibi tenuis naſcentem arceſſere vitas
Scilicet huc reddi deinde ac reſoluta referri
Omnia;

Omnia: nec morti esse locum, sed viva volare
Sideris in numerum, atque alto succedere cælo.

Principio cælum ac terras, camposque liquentis,
Lucentemque globum Lunæ, Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et magno se corpore miscet.
Inde hominum pecudumque genus, vitæque volantum,
Et quæ marmoreo fert monstra sub æquore pontus.
Igneus est ollis vigor, et cælestis origo
Seminibus, quantum non noxia corpora tardant,
Terrenique habetant artus, moribundaque membra.

But no poet has been more fortunate in expreſſing thoſe ſentiments than POPE, who certainly muſt have had in view VIRGIL's lines; which, however, he has undoubtedly ſurpaſſed in the following admirable verſes:

" All are but parts of one ſtupendous whole,
" Whoſe body Nature is, and GOD the ſoul:
" That, chang'd through all, and yet in all the ſame,
" Great in the earth, as in th' etherial frame.

" Warms in the ſun, refreſhes in the breeze,
" Glows in the ſtars, and bloſſoms in the trees,
" Lives through all life, extends through all extent,
" Spreads undivided, operates unſpent."

It has been ſuſpected, and with ſome appearance of reaſon, that theſe ſentiments which POPE hath ſo happily expreſſed, had been communicated to him by LORD BOLINGBROKE, who meant to convey by them opinions very different from what POPE had in view. They are certainly very nearly, if not preciſely, the ſame with thoſe which make part of SPINOZA's ſyſtem of Atheiſm. But, diſregarding this ſuſpicion, which, with reſpect to POPE, at leaſt, would be highly unjuſt, as well as groundleſs, we may conſider his verſes as *bona fide* intended to expreſs, in a forcible and lively manner, the juſt and pious ſentiments of a philoſopher ſtrongly impreſſed with the perception of that power, and wiſdom, and goodneſs, which every part of nature ſo amply diſplays. Conſidered in this point of view, they are unexceptionably good. But it muſt be remembered, that they are only poetical,

poetical, and very highly metaphorical, expreſſions of thoſe juſt and pious ſentiments, in which every perſon of ſound judgement muſt acquieſce; but by no means accurate and literal expreſſions of ſtrict philoſophical truth.

We admit them, and we are pleaſed with them, as we are with many ſimilar proſaic, but not leſs ſublime, expreſſions of our own dependence on the power and goodneſs of GOD. Thus, in ſpeaking of the Supreme Being, we call him our Father; we ſay, that in him we live, and move, and have our being. Such expreſſions, taken metaphorically, are juſt and pious; but taken literally, they would be impious, as well as extravagant.

To ſuppoſe that when we call GOD our Father, we mean to expreſs literally the ſame relation between him and us that we uſually expreſs by the word *Father*; or to ſay that we have no other fathers or anceſtors but him, would be either impiety or inſanity in the higheſt degree.

To

To ſuppoſe that the admiſſion, that in him we live, and move, and have our being, ſhould ſuperſede all phyſical inquiries into the ſtructure and functions of our bodies, by which we are enabled to live, and move, and have our being in this world, would be not merely unphiloſophical, but extravagant.

On the ſame principle, and for the ſame reaſons, when we admit as juſt as well as pious, the ſentiments of POPE, and VIRGIL, and other poets, with reſpect to the dependence of all natural phenomena on the agency of the Supreme Being, it is only in ſuch a general and metaphorical ſenſe, as ſhall leave the inquiry into the nature and influence of all ſecondary and ſubordinate cauſes, as entire and free as the inquiry about the father and other anceſtors of a perſon, in point of genealogy, is left, after admitting that GOD is the Father of all.

If ſuch expreſſions and ſentiments had been confined to poets only, there could have been no occaſion to conſider them in the

the proſecution of my inquiry. But that has not been the caſe: they have been conſidered by ſome philoſophers as rational opinions at leaſt, and fit ſubjects of ſcientific inquiry, if not even ſelf-evident truths, or what I ſhould call Laws of human Thought.

Of this I need offer no other proof than by quoting a few paſſages from the writings of one, whoſe freedom both from common and from philoſophical prejudices, as well as his ſuperior talents, and his zealous and ſucceſsful efforts in the purſuits of ſcience, though they cannot, in an age of liberal and rational inquiry, give to his opinions the force of authority, muſt intitle his ſentiments to peculiar attention, and to the ſtricteſt examination. I allude to DR REID, from whoſe *Eſſays on the Active Powers of Man* the following paragraphs are ſelected.

" The exertion of active power we call *Action*; and as every action produces ſome change, ſo every change muſt be cauſed by ſome exertion, or by the ceſſation of ſome

ſome exertion of power. That which produces a change by the exertion of its power, we call the *Cauſe* of that change; and the change produced, the *Effect* of that cauſe."

Page 12. 13.

" From this principle it follows, that every thing which undergoes any change muſt either be the efficient cauſe of that change in itſelf, or it muſt be changed by ſome other being.

In the firſt caſe, it is ſaid to have *active power*, and to *act* in producing that change. In the ſecond caſe, it is merely *paſſive*, or is *acted upon*; and the active power is in that being only which produces the change."

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" Thus we ſay, the ſun riſes and ſets, and comes to the meridian, the moon changes, the ſea ebbs and flows, the winds blow. Languages were formed by men who believed theſe objects to have life and active power in themſelves. It was therefore

fore proper and natural to expreſs their motions and changes by active verbs."

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" But as to the real cauſes of the phænomena of nature, how little do we know! All our knowledge of things external muſt be grounded upon the information of our ſenſes; but cauſation and active power are not objects of ſenſe; nor is that always the cauſe of a phænomenon which is prior to it, and conſtantly conjoined with it; otherwiſe night would be the cauſe of day, and day the cauſe of the following night.

It is to this day problematical, whether all the phænomena of the material ſyſtem be produced by the immediate operation of the firſt cauſe, according to the laws which his wiſdom determined, or whether ſubordinate cauſes are employed by him in the operations of nature; and if they be, what their nature, their number, and their different offices are? And whether, in all caſes, they act by commiſ-

ſion, or, in ſome, according to their diſcretion?"

Page 286.

"A conſtant antecedent, or concomitant of the phænomenon whoſe cauſe is ſought, may anſwer the purpoſe of the inquirer, as well as if the real cauſe were known. Thus, a ſailor deſires to know the cauſe of the tides, that he may know when to expect high water: he is told, that it is high water when the moon is ſo many hours paſt the meridian. And now he thinks he knows the cauſe of the tides. What he takes for the cauſe anſwers his purpoſe, and his miſtake does him no harm."

Page 287.

It can hardly eſcape obſervation, that the notion of cauſe, as thus explained by Dr Reid, is widely different from that commonly adopted by philoſophers, either Metaphyſicians or phyſical inquirers; ſo very different indeed, that the axiom, *Every change or effect muſt have a cauſe*, as underſtood by him, will ſcarce be admitted

ted even by phyſical inquirers; and will not only not be admitted by Metaphyſicians as a principle univerſally true, but will be regarded by many of them, eſpecially by DR PRIESTLY, and all the diſciples of MR HUME, as univerſally falſe, and even impoſſible.

The reaſon of this ſtriking difference between them plainly is, that DR REID, like many philoſophers who had preceded him, had attended too much to one kind of *Cauſe*, or principle of change, namely, what a man, or any other *living* Being, is to his own voluntary actions, or to thoſe changes which he produces directly in himſelf, and indirectly in other beings, by the occaſional exertion of his own power. This kind of *Cauſe* may be called excluſively *an Agent*; I mean, merely for diſtinction's ſake, not as implying any opinion about it. That there are ſuch *Agents*, and that many *Events* are to be referred to them, as either wholly or partly their *Cauſes* or principles of change, I acknowledge to be certain, and even ſelf-evident. But that *all Events*, without exception, are to be referred to

ſome *ſuch Cauſes*, and neceſſarily imply the operation of *Agents*, and the exertion of *Power*, I can by no means admit; for I neither perceive it as a ſelf-evident neceſſary truth, nor have I ever met with any evidence of it.

It appears to me, that DR REID, and many philoſophers who have thought and argued nearly as he hath done on this point, have gone juſt as far wrong on one ſide as MR HUME, DR PRIESTLY, or MR LEIBNITZ, or, in general, all aſſertors of the doctrine of Neceſſity, have done on the other. Theſe philoſophers have attended too much to another kind of *Cauſe*, which we ſhall call, but merely for the ſake of diſtinction, and without implying any opinion about it, *Phyſical Cauſe*; as, for example, what impulſe is to motion, heat to expanſion, fuſion, and evaporation, the earth to the fall of a ſtone towards it, the ſun and moon to the tides, &c. That there are ſuch *Cauſes*, or, in other words, that we conceive ſome relation to ſubſiſt between the various things and events reſpectively that have been mentioned, which

which relation we are accuſtomed to expreſs by the terms *Cauſe* and *Effect*, is, I think, juſt as certain as that there are *Agents* for other *Events*. It appears to me likewiſe abundantly evident, that theſe two relations are ſomehow different from one another; and that both of them are very different, and eaſily diſtinguiſhable, from various other relations of event.

When I ſay, that heat is the cauſe of the melting of ice, I mean, and I preſume I ſhall generally be underſtood, to expreſs a certain relation between the heat and that event, and a relation eſſentially different from that between a man and any of his voluntary actions; different too from that between motive and action; different even from that between evidence and belief; different from that between the vital principle (or life) of a plant or animal and its growth, its functions, and its diſeaſes; different from that between the various occaſional or exciting cauſes, (ſuch as Air, Water, Light, Heat, Cold, Contagion, Poiſon, &c.), and the growth, the functions, and the diſeaſes, of plants and

and animals; different even, in ſome meaſure, from that between impulſe and motion; and different from that between any body and the fall, or tendency to fall, of another body towards it.

All theſe relations, which I mention only as ſpecimens, but by no means as a complete enumeration, of the various relations of event, and of the different *genera* and *ſpecies* of Cauſes, I conceive to be not only different, but eaſily diſtinguiſhable from one another; and I ſhould think it impoſſible for any one, who had the ordinary faculties of mankind, to confound any one of them with the ſimple relation of priority and ſucceſſion among things and events; as, for example, that between day and night, or between the morning dawn and the riſing of the ſun. No man ſurely ever regarded the dawn as the cauſe of the riſing of the ſun, or night as the cauſe of day. But as the philoſophy of Mr Hume, which ſome other Metaphyſicians have been proud to adopt, and even his definitions and explanations of the relation of cauſe and effect, lead men to confound

found all thoſe notions, it may be expedient to keep in view the ſimple relation of priority and ſucceſſion, even in our inquiries concerning cauſes; were it only that we may be the better enabled to perceive what more there is in the relation of every kind of cauſe and event, than merely the one ſucceeding the other.

I ſhould think it almoſt equally impoſſible for men of ſenſe and competent knowledge to confound any one of thoſe relations with that of *neceſſary* connection or relation, which we either perceive intuitively, or diſcover by reaſoning, in geometry. Theſe connections in geometry are not even relations of event, but only of quantity. Yet they have been in ſome meaſure confounded with the others, in the reaſonings of many philoſophers, both ancient and modern. Many of ARISTOTLE's illuſtrations, in his reaſonings about cauſes, are taken from geometry. In modern times, it has been thought extravagant and impious to doubt of the neceſſity of the relation of cauſe and effect; poſſibly in a great meaſure becauſe that opinion

was

was held by MR HUME, who no doubt thought he had made a great diſcovery in metaphyſics when he ſhewed that we had no perception and no proof of any neceſſity in the relation between particular cauſes and their effects. On this account it may be proper to have in view the neceſſary relations of quantity, as well as that of ſimple priority and ſucceſſion of events, in examining the various kinds of cauſes, and their ſeveral relations to the events proceeding from them.

The moſt common tendency among philoſophers who have ſpeculated concerning the nature and influence of cauſes, at leaſt in modern times, has been to overlook ſome of the kinds of cauſes that have been mentioned, and to confound others of them; to attend chiefly to *phyſical cauſes*; to ſuppoſe that for every event, even for the voluntary action of a living perſon, there *muſt be* ſuch a cauſe; to maintain that the relation of motive and action is eſſentially the ſame with that between phyſical cauſe and effect; and thereby to exclude, not only the neceſſity, but almoſt the

the poſſibility, of the operation of an *Agent*, or cauſe of that kind which Dr Reid, in the paſſages quoted from his Eſſays, and which many other philoſophers have thought univerſally neceſſary for the production of change.

After the moſt careful examination of the ſubject, I cannot help diſſenting from both thoſe philoſophical ſyſtems; from the one, becauſe I think there are many events which we have no reaſon whatever, either from the primary laws of human thought, or from particular obſervation, experiment, and induction, to refer to *Agents*; from the other, becauſe I think there are many events, for example the voluntary actions of mankind, which ought to be referred to *Agents* as their proper and chief principles of change.

When we refer the voluntary action of a perſon to the agent as the author of it, that is, as the *Cauſe*, or principle of change, from which it proceeded, we cannot reaſonably be charged with maintaining the abſurdity, that there may be an

event or effect without a cauſe. As little can we be charged with that abſurdity, when we refer the melting of ice, and the boiling of water, to heat; and when we refer the fall of a ſtone to the ground, and the ebbing and flowing of the ſea, to the influence of the earth on the ſtone, and of the ſun and moon on the ocean, according to the principle of general gravitation. We have, I think, every reaſon that the nature of the ſubject and of our own faculties can admit of, to believe, that there are among things inanimate, and conſequently incapable either of *power* or *activity*, (in one ſenſe, and that too the literal and moſt common ſenſe of theſe terms), ſuch relations that they may be mutually cauſes or principles of change to one another, without any exertion of *power*, or any operation of an agent ſtrictly ſo called. Such relations, for aught that we know, may take place among bodies at great diſtances from one another, as well as among bodies really or ſeemingly in actual contact; and they may vary, both in degree and in kind, according

ding to the diſtances between the bodies.

From the moſt extenſive and accurate obſervation of many familiar events, we infer, that there are ſuch relations among things inanimate. But we know them only as matters of fact. We may reaſonably doubt, and perhaps inquire, whether they be ſtrictly neceſſary truths, like thoſe of geometry, or matters of arbitrary appointment, like the laws of Cheſs, and of all other games. The reſult in point of event, in any given caſe of the application of ſuch cauſes, will be the ſame, whether the relation among the bodies be neceſſary, or contingent and arbitrary; provided only it be eſtabliſhed and conſtant.

It is perfectly conceivable, that a relation of event, ſtrictly neceſſary, and independent of any arbitrary appointment, may be known to us only as a matter of fact, and learned only by obſervation, experiment, and induction; juſt as ſome geometrical propoſitions, for example the 47th and 48th of the firſt book of Eu-

CLID, which are known to men of ſcience as ſtrictly neceſſary truths, are known to many carpenters and bricklayers only as matters of fact; and might have been learned by ſuch men by means of repeated trials, and inductive reaſoning. It is even conceivable, that our faculties, which are abundantly ſufficient to enable us to underſtand the difference between the two ſuppoſeable caſes, may not be ſufficient to enable us to decide the queſtion, nor to perceive the neceſſity of ſuch relations, however real it may be; juſt as the faculties of a ſtupid and ignorant bricklayer may not be ſufficient to enable him to underſtand the demonſtrations of the firſt book of EUCLID, that is, to perceive the neceſſity of thoſe relations of quantity which are demonſtrated in it; though he may underſtand the mere propoſitions, and be able to apply them to practical uſe in his daily occupation; as, for example, to make the angles of his buildings right angles, by *ſetting off* at each of them a triangle of ſuch proportions, that the ſquare of the ſide oppoſite to the angle, which he wiſhes to be a right one, ſhall be

equal

equal to the ſum of the ſquares of the two ſides which form that angle.

Suppoſing that ſome of the relations of event, particularly that of phyſical cauſe and effect, comprehending the circumſtance of their *conſtant conjunction*, as it has been very properly called, which ſeems always to be implied in ſtrict phyſical reaſonings, as well as in the common notions and actual conduct of mankind, are neceſſary, like thoſe of quantity, which are the objects of mathematical reaſoning; the opinion, that there *muſt* be an exertion of power or activity to produce ſuch events, would be not merely erroneous, but abſurd: for, on that ſuppoſition, no power or agency would be requiſite to produce them, any more than to produce the relations of geometry; and no power in heaven or earth could prevent them from being what they are.

If that ſuppoſition be thought extravagant or impious, let us take the more modeſt, and perhaps more rational ſuppoſition, that ſuch relations, comprehending that

that circumſtance of conſtant conjunction, ſubſiſt only by the wiſe but arbitrary appointment of the Supreme Being, who might have made them different if he had thought fit; ſtill the neceſſity, at leaſt, if not the poſſibility, of any exertion of power, or of any agency, would be completely excluded; while ſome other relations of event, that do not comprehend the circumſtance of the *conſtant conjunction* of the cauſe with its effect, but, on the contrary, imply their occaſional and very frequent ſeparation, as, for example, the relation of motive and action, not only do not exclude, but abſolutely require and imply, the operation of an agent, and the exertion of power.

If any perſon wiſh to conſider more fully this general and very abſtruſe point, let him be peculiarly careful to attend to the *things* and to the *ſuppoſitions* in queſtion, and not to be miſled or confounded by the ambiguous words and phraſes generally employed on this ſubject, and by the nugatory arguments founded on them. Let it be remembered, that the queſtion is not, whether

whether body can *act*, either where it is, or where it is not; but ſimply, whether it be conſiſtent with the laws of human thought to believe, that ſuch relations may ſubſiſt among bodies, either by neceſſity, or the nature of things, or by the arbitrary appointment of the Deity, that they ſhall, in certain circumſtances, be mutually cauſes or principles of change to one another.

It is plain from the paſſages quoted from Dr Reid's Eſſays, and indeed from the whole tenor of his reaſonings on theſe ſubjects, that he holds firmly that opinion which appears to me to be erroneous; and that he had not attended to the many important differences among the ſeveral kinds of cauſes; eſpecially between *Agent* and *Phyſical Cauſe*.

Suppoſing him to be wrong in his opinion on the point in queſtion, it is but juſtice to him to acknowledge, that his error can in no degree affect the validity of his obſervations and reaſonings in morals, or with reſpect to the active powers of man:

truly philoſophical uſe of the evidence which language affords with reſpect to thought. But on this point I think his obſervations inaccurate and inconcluſive, and his induction imperfect, and conſequently erroneous.

The ſubject, which is undoubtedly a curious and extenſive one, and, as I think, really important with a view to ſcience, muſt be fully conſidered in the proſecution of my inquiry. At preſent I ſhall only obſerve, that DR REID, in the paſſages under conſideration, has not attended ſufficiently, if at all, to the very different import of *Neuter* from that of *Active* and of *Paſſive* verbs; and that he ſeems quite to have overlooked the difference between the literal and the metaphorical uſe of *Tranſitive* verbs, either in the *Active* or *Paſſive* voice.

The metaphorical uſe of ſuch verbs is the moſt common of all metaphors. I believe indeed it is nearly univerſal in all languages, and has become almoſt indiſpenſable, and ſo familiar to all mankind,

that they can ſcarce be prevailed on to attend to it, or to regard it as metaphorical and ambiguous. It has been a grievous ſtumbling block to many philoſophers, as well as to DR REID. Of this no other evidence can be needed than what MR LOCKE hath afforded in his philoſophical writings.

It appears ſufficiently from what he ſays, book II. chap. XXI. ſect. 20. that he perceived clearly what embarraſſment and confuſion reſulted from a metaphorical uſe of ſuch expreſſions as implied the notion of agency, or operating, in things of which Agency, in its ſtrict and literal import, is not predicable. But he adds, " It looks like too much affectation " wholly to lay them by; and philoſophy " itſelf, though it like not a gawdy dreſs, " yet, when it appears in public, muſt " have ſo much complacency, as to be " cloathed in the ordinary faſhion and " language of the country, ſo far as it can " conſiſt with truth and perſpicuity. But " the fault has been, that faculties have " been ſpoken of, and repreſented as ſo " many diſtinct agents."

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The truth is, that the implication of agency by the uſe of ſuch expreſſions, is improper with reſpect to motives and phyſical cauſes, as well as with reſpect to faculties, and leads to much perplexity and ambiguity, as LOCKE well knew. Yet in the courſe of his inquiries, and even in that very chapter *(Of Power)* in which it was of the utmoſt conſequence for him to guard againſt ſuch ambiguities, he got into a puzzle by means of them, as he very candidly acknowledges, (ſect. 71.), and endeavours to get out of as well as he can. But in this he hath not ſucceeded. The whole train of reaſoning in that chapter, and particularly in that 71ſt ſection of it, is perverted, and rendered unſatisfactory, and in many places almoſt unintelligible, in conſequence of that very ambiguous and metaphorical uſe of ſuch common expreſſions as thoſe under conſideration.

We want an inſtrument that ſhall fairly ſeparate and diſtinguiſh all our different thoughts, as NEWTON's Priſm does with reſpect to the different rays of light; and

L'ame n'eſt elle pas capable de penſer? En la conſiderant ſimplement par cet endroit, je l'apelle ENTENDEMENT *ou* INTELLIGENCE. *N'eſt elle pas capable en certaines occaſions de vouloir à ſon grè et à ſon choix une choſe, ou de ne la vouloir pas? Par cet endroit je l'apelle liberté.*"

But the various ambiguities and perplexities in reaſoning that reſult from the vague and metaphorical uſe of the expreſſions, which, in their ſtrict and literal meaning, denote agency, and the differences between the relation of agent and action and that of cauſe and effect in phyſics, cannot be properly diſcuſſed in ſuch a preliminary diſſertation as this. At preſent I can do no more than barely mention that there are ſuch ambiguities, and ſuch differences, which ſhall be conſidered fully in the proſecution of my inquiry. Nay, tho' in ſtudying the ſubject I had begun with examining thoſe things, I dare not begin by offering to the public the reſult of my inquiries with reſpect to them. For whatever I may think of the importance of that part of my inquiry, or of my own ſucceſs

in

in the inveſtigation of it, I am perfectly ſenſible that I can claim no merit in literature or ſcience that ſhould intitle me to call the attention of men of ſcience to a ſubject which hitherto they have either overlooked altogether, or have conſidered as unworthy of their attention.

I think it better to begin with ſubmitting to their judgement the reſult of my inveſtigation with reſpect to the difference between the relation of motive and action and that of cauſe and effect in phyſics; for this is a point that many philoſophers of the greateſt name in modern times have conſidered as of great importance, and which is at this day a matter of keen controverſy among many living philoſophers.

It will be evident, that the aſcertaining of it muſt tend greatly to facilitate the inveſtigation of the difference between the relation of agent and that of phyſical cauſe, by explaining in ſome meaſure the nature of the former; and, what is more to my purpoſe at preſent, if it ſhall be found that I have ſucceeded in exploring

ring the difference between the relation of motive and that of phyſical cauſe, I ſhall think myſelf intitled to call the attention of men of ſcience to the other ſubject, the nature and importance of which they ſeem not in general to have known.

As the ſubject of my firſt Eſſay, the only one at preſent publiſhed, has employed the thoughts and the pens of many great philoſophers during the laſt hundred and fifty years, and ſtill remains a matter of diſpute among them, it may reaſonably be expected that I ſhould ſtate what pretenſions I can have to be liſtened to in treating of it; for it will be taken for granted, that I have, or think I have, ſomething very much to the purpoſe to offer, when I voluntarily begin with the diſcuſſion of a ſubject, on which it appears not unreaſonable to ſuppoſe that all the powers of the human underſtanding have already been exerted in vain.

The claims of my Eſſay to ſome attention,

tion, and, though to no favour, to a ſtrict and rigorous examination, are as follow.

1. It is perfectly new, and even ſingular, in every reſpect; which, on ſo trite a ſubject, is ſurely a recommendation.

2. It contains nothing in the leaſt unfriendly to the intereſts of religion, of virtue, or of uſeful knowledge.

3. It contains nothing contrary to common ſenſe.

4. It contains no appeals to common ſenſe; which appeals many philoſophers might regard as nugatory and contemptible.

5. It contains no appeals to conſciouſneſs with reſpect to any matter of fact; which appeals might place men of ſcience in the unpleaſant ſituation of contradicting one another, in circumſtances where one party or the other muſt be deemed guilty of wilful falſehood.

6. It

6. It contains the means of detecting falſehood, if any already has been, or hereafter ſhall be employed, by either party, in the controverſy, with the ſame degree and kind of evidence that is held ſufficient to convict a perſon of bearing falſe-witneſs in a court of juſtice.

7. It brings a long-laſting metaphyſical controverſy to the teſt of that kind and degree of evidence which we have in mathematical and phyſical ſcience; employing only ſtrict mathematical reaſoning by neceſſary conſequences, and bringing the reſult of ſuch reaſoning, and every queſtion of fact, to the teſt of open unequivocal experiment.

The very peculiar mode that I have employed in treating this ſubject was ſuggeſted to me, near ten years ago, by the following judicious remarks and happy illuſtrations of DR REID, in his *Eſſays on the Intellectual Powers of Man*; which work I had the pleaſure of peruſing ſome years before it was publiſhed.

In treating of analogy, and pointing out the imperfections and dangers of certain analogical reaſonings, he ſays, (p. 55. 56.)

" To illuſtrate more fully that analogical reaſoning from a ſuppoſed ſimilitude of mind to body, which I conceive to be the moſt fruitful ſource of error with regard to the operations of our minds, I ſhall give an inſtance of it.

When a man is urged by contrary motives, thoſe on one hand inciting him to do ſome action, thoſe on the other to forbear it; he deliberates about it, and at laſt reſolves to do it, or not to do it. The contrary motives are here compared to the weights in the oppoſite ſcales of a balance; and there is not perhaps any inſtance that can be named of a more ſtriking analogy between body and mind. Hence the phraſes of weighing motives, of deliberating upon actions, are common to all languages.

From this analogy, ſome philoſophers draw very important concluſions. They ſay,

ſay, that as the balance cannot incline to one ſide more than the other, when the oppoſite weights are equal; ſo a man cannot poſſibly determine himſelf, if the motives on both hands are equal; and as the balance muſt neceſſarily turn to that ſide which has moſt weight, ſo the man muſt neceſſarily be determined to that hand where the motive is ſtrongeſt. And on this foundation ſome of the ſchoolmen maintained, that if a hungry aſs were placed between two bundles of hay equally inviting, the beaſt muſt ſtand ſtill, and ſtarve to death, being unable to turn to either, becauſe there are equal motives to both. This is an inſtance of that analogical reaſoning, which I conceive ought never be truſted: for the analogy between a balance and a man deliberating, though one of the ſtrongeſt that can be found between matter and mind, is too weak to ſupport any argument. A piece of dead inactive matter, and an active intelligent Being, are things very unlike; and becauſe the one would remain at reſt in a certain caſe, it does not follow that the other would be inactive in a caſe ſomewhat

ſimilar. The argument is no better than this, that becauſe a dead animal moves only as it is puſhed, and, if puſhed with equal force in contrary directions, muſt remain at reſt; therefore the ſame thing muſt happen to a living animal: for ſurely the ſimilitude between a dead animal and a living, is as great as that between a balance and a man."

The two caſes put by DR REID, in this illuſtration, the dead horſe under the influence of certain forces or phyſical cauſes of motion, and the living horſe under the temptation of certain bundles of hay, appear to me fair inſtances of the two different kinds of cauſes and relations of event, which we expreſs by the phraſes, *Motive* and *Action*, and *Cauſe* and *Effect* in phyſics. Each of theſe relations, no doubt, may juſtly be regarded as a *Genus*, comprehending ſeveral *Species*, the differences among which may be very curious and important, while yet there is ſomething, probably a great deal, in common among all the different *Species* of each *Genus* reſpectively.

No

No perſon of competent attention and judgement will diſpute, that there is much in common, and yet many things different in the influence or relation of various kinds of motives, ſuch as Inſtincts, Appetites, Paſſions, Deſires, Judgements of Duty, Expediency, &c.: nay, it cannot reaſonably be diſputed, that there are ſome differences of the relation, though in the main it be the ſame, according to the degree of certain motives. Thus, a certain degree of Pain, of Hunger, or of Fear, will be generally underſtood to amount to compulſion, which a much lower degree of them would not be conceived to do.

As little can it admit of doubt, that there are ſome conſiderable differences among the influences or relations of different phyſical cauſes, even with reſpect to bodies perfectly inanimate; that is, excluding all ſubſtances that have animal or vegetable life. Thus there is a difference between the relation of mechanical and chemical cauſes; enough at leaſt to ſhew, that in the production of chemical phæno-

mena,

mena, ſomething elſe is concerned beſides the obvious external cauſe applied; as, for example, heat. The three different chemical ſtates of bodies, Solidity, Fluidity, and the form of Elaſtic Vapour, which we refer to different degrees of heat as their phyſical cauſes, are not purely the effect of ſuch cauſes; nor are they perfectly indifferent to any bodies, as reſt and uniform progreſſive rectilinear motion are to all bodies. A body once put in motion with any velocity, and with any rectilinear direction, will continue in motion with that velocity and in that direction, though the cauſe of its motion be removed. But a body will not remain in the form, either of an aeriform, or of an aqueous fluid, when the heat which was the cauſe of its being in one or other of thoſe forms is withdrawn.

In another point of view, we may obſerve, that the effects of heat (expanſion, fuſion, evaporation) are not uniformly nor regularly proportioned to the degree or quantity of the cauſe in different bodies, nor even in the ſame body. The *kind* of the

the effect, as, for example, the change of form, is very different in different degrees of heat; unlike that uniformity of the effect in kind, and its proportion in degree, with respect to quantity and direction of motion, according to the quantity and direction of the force or cause of motion applied.

Men may doubt whether these differences, and peculiarities in the influence of chemical causes, depend on the chemical relations of the particles of bodies to one another, or on some other perhaps unknown and unsuspected causes. But the facts mentioned are as unquestionable as that bodies left to themselves will not continue in a curvilinear, or accelerated, or retarded motion; as they will in a rectilinear and uniform motion, or as they will continue at rest.

If such chemical phænomena as fermentation, crystallization, solution, and other elective attractions, as they are called, be considered, and be compared with the phænomena of mechanical philosophy,

the differences between theſe two *Species* of phyſical cauſes will be ſtill more apparent.

If the phyſiological and pathological phænomena of animal and vegetable life be examined, and if the relation of them to their ſeveral external, exciting, occaſional cauſes be duly conſidered, ſtill greater differences between the influence of ſuch cauſes and that of mechanical and chemical cauſes on the one hand, and that of motives on the other, will eaſily be diſcovered; and evidence will probably be found, that ſome other principle of change, or kind of cauſe, different from a living intelligent *Agent*, and different from any mechanical or chemical cauſe, is concerned in the production of ſuch phænomena.

None of theſe differences are to be diſregarded in ſuch an inquiry as mine; and it may be expedient occaſionally to have recourſe to all thoſe and many other inſtances of different relations of event, for ſuch illuſtrations as they can afford. But for

for ſhewing the difference between the relation of motive and action and that of phyſical cauſe and effect, it is ſufficient to conſider each of them in the moſt general view, without regard to the ſpecific differences either of motives or of phyſical cauſes.

Such a view of them DR REID's illuſtration preſented to me.

There could be no doubt that the reſult would be very different in the caſe of the phyſical cauſes applied to the dead horſe, and in that of the motives applied to the living one. The dead horſe muſt be conceived to be on the ſame footing with a ſtone, or any lifeleſs body, under the influence of equal oppoſite forces. The living horſe muſt be conceived to be on the ſame footing with a living man under the influence of equal oppoſite motives, or of equal oppoſite forces. It was plain to me, that the dead horſe muſt remain at reſt, as a dead man would do in the ſame circumſtances; and equally plain to me, that neither a living man nor a living horſe would do ſo.

It was eaſy to know what account would be given of this difference by thoſe who profeſſed to believe that there is no eſſential difference between the two relations in queſtion; but as this account of the different reſult in the two caſes conſiſts of an arbitrary and gratuitous hypotheſis, I could not acquieſce in it. This, however, I was ſenſible was no refutation of it.

It next occurred to me, that the caſe put, to wit, the application of *equal* and *oppoſite* motives and phyſical cauſes, was but *one* out of many caſes of the application of them reſpectively, that might be clearly conceived, and, if needful, might be tried experimentally.

The cauſes or motives applied might be oppoſite without being equal, or equal without being oppoſite; whether equal or unequal, they might exactly concur, or they might neither exactly concur, nor directly oppoſe one another.

In all theſe different caſes, I could foreſee

ſee with perfect certainty what *would*, and, as I conceive, *muſt* neceſſarily, be the reſult, in the application of phyſical cauſes of motion to the lifeleſs body. But I could not perceive as *neceſſary*, nor even as *certain*, what the reſult would be in the correſponding caſes of the application of motives. But I could perceive, with a degree of *probability* approaching ſo near to *certainty* as to ſuperſede the neceſſity of trying any experiment, that the reſult from the application of motives would be totally different from that of phyſical cauſes in the correſponding caſes. Some of theſe differences, too, appeared to me of ſuch a kind as to preclude the neceſſity, at leaſt, if not even the poſſibility, of arbitrary hypotheſes, and of appeals to conſciouſneſs.

On conſidering on what this certainty or neceſſity of the reſult in all caſes of the application of phyſical cauſes depended, I perceived at once, that it implied at leaſt this circumſtance in the relation of ſuch cauſes to their effects, that the influence of the cauſes was conſtant; or, in other

words, that they always had their full effects in kind and in degree, whenever they were applied. The only other circumſtance that I could find to be requiſite to the certainty or neceſſity of the reſult was, that the body or ſubject ſhould be incapable of moving itſelf; which, whatever be the origin of the notion of ſuch *inertia*, whether a kind of inſtinct, or a ſort of rude induction from many familiar obſervations, is always comprehended as part of the conception of a lifeleſs body.—— Both thoſe circumſtances ſeemed to me to be included in MR HUME's account of the relation of cauſe and effect; to wit, that all we knew of it was only the *conſtant conjunction* of two objects.——Thoſe two circumſtances taken together amounted to a perfect excluſion of any kind or degree of liberty or ſelf-governing power in the ſubject.

But I found the reſult quite different in the correſponding caſes of motives applied; contrary to what MR HUME, DR PRIESTLY, and all other aſſertors of Neceſſity had maintained. It was plain, then,

then, to me, that there muſt be a difference between the two caſes with reſpect to one or both of thoſe circumſtances on which the certainty or neceſſity of the reſult from the application of phyſical cauſes depended.

I ſoon perceived, that the influence or effect of motives was not conſtant, as the general aſſertions, and the particular and very pointed illuſtrations of MR HUME and DR PRIESTLY, repreſent it to be; but that it was only occaſional and ſeparable.

This, however, did not fully explain the difference between the two relations in queſtion; for the ſeparability of motive and action, though a very important circumſtance, is not the only point in which this relation differs from that of phyſical cauſe and effect: nor did the aſcertaining of that point even refute the doctrine of Neceſſity as generally maintained, by proving, that there is in living perſons any ſelf-governing power, or liberty, or independent activity, different from what there

is

is in a lifeleſs body. It might ſtill be maintained, that though motives are ſeparable, and in fact are often completely ſeparated, from their correſponding actions, this is not done by the perſon having and exerting any optional or ſelf-governing power, to conjoin ſome motives and actions, and ſeparate others; but that it comes to paſs, either abſolutely by chance, or elſe in conſequence of ſome ſuch law or eſtabliſhed relation among motives, that in certain circumſtances ſome of them ſhould have effect in point of action, and not others; in ſuch a manner, however, as to exclude any liberty in the agent. The former ſuppoſition, of abſolute chance, is eaſily ſhewn to be falſe, and even abſurd: the latter appears more plauſible, and even analogous to what actually takes place in the relation of evidence and belief.

With reſpect to this relation, we certainly have no choice, liberty, or ſelf-governing power: the force or influence of evidence is abſolute and irreſiſtible, and our belief is completely determined by it. Yet, in many caſes, evidence of various kinds

kinds has no influence or effect in point of belief; or, in other words, is not conjoined with its uſual and proper effect, but plainly ſeparated from it; as, for example, teſtimony in oppoſition to diſtinct memory, or to immediate perception, or to mathematical demonſtration.

Some vague and confuſed notion of ſuch a kind of abſolute irreſiſtible influence of motives in point of voluntary action ſeems to have been adopted by Metaphyſicians, and is implied in the perſuaſion, that the ſtrongeſt of oppoſite motives will not only prevail, but have its full effect, as if unoppoſed; for this want of effect in the ſuppoſed weaker oppoſing motives is juſt the *ſeparation* of them from their proper effects or actions; about which occaſional ſeparation, in contradiſtinction to the *conſtant conjunction*, or uniform influence and effect of phyſical cauſes, I undertake to reaſon ſtrictly by neceſſary conſequences.

My next ſtep was to trace the ſtrictly neceſſary conſequences of the ſuppoſition of

of the abſolute irreſiſtible force of motives ſeparable from their reſpective actions, and without any ſelf-governing power in the perſon, by-which he might conjoin or ſeparate them at his diſcretion.

I ſoon found that even this ſuppoſition implied neceſſary conſequences with reſpect to motives and actions, which, if not ſtrictly ſpeaking abſurd and impoſſible, were at leaſt ſo extravagantly and ridiculouſly falſe, that I could not ſuppoſe that any the moſt arrogant aſſertors of the doctrine of Neceſſity would admit them, or think it neceſſary even to put them to the teſt of experiment.

I was at firſt, I muſt own, a little ſurpriſed to find, that the correſponding inferences with reſpect to phyſical cauſes and effects from the ſame principles, to wit, the want of ſelf-governing power in the ſubject, and the irreſiſtible influence of cauſes not conſtantly conjoined with their effects, ſeemed to be true as matters of fact, and appeared even ſo familiar and well known, that there could

could be no occaſion to try them experimentally.

I began even to ſuſpect that there muſt be ſome error in my reaſoning, that led to concluſions ſeemingly true from a principle that I knew to be falſe: for I had found ample evidence before, that the circumſtance of conſtant conjunction was a part of the relation of cauſe and effect in phyſics.

On further examination, I ſoon found on what this unlooked-for coincidence depended. My inferences, tho' they were the truth, and nothing but the truth, were not the whole truth, with reſpect to the reſult in the caſes of phyſical cauſe and effect. They were true as being ſtrictly neceſſary inferences from what was true in that relation, and in the peculiar ſuppoſition with reſpect to it which I was conſidering; namely, the want of ſelf-governing power in the ſubject, and the abſolute force of the cauſes applied, without regard to the conſtancy or the inconſtancy of the conjunction of them with their effects.

They were not the whole truth, becauſe there was not included in the premiſes, or particular ſuppoſition, whence they were deduced, that circumſtance of the conſtant conjunction of cauſe and effect, which is really part of this relation. The ſame inferences were falſe with reſpect to motives and actions, although they proceeded on the principle of the ſeparability of theſe, which is true; and on the ſuppoſition that a motive will have its full effect when oppoſed only by one weaker than itſelf, which has been generally admitted; becauſe they were ſtrictly neceſſary inferences from principles that are falſe; to wit, the want of ſelf-governing power in the ſubject, and the abſolute irreſiſtible force of the motives or cauſes applied. And they appear extravagant and ridiculous, not to the vulgar only, but to Metaphyſicians, who aſſert thoſe very principles from which they are fairly deduced, becauſe they are inconſiſtent with our moſt familiar knowledge of human nature, and with principles or laws of human thought, which philoſophers, whatever they may pretend, cannot

cannot alter either in themſelves or in others.

The *Dilemma* requiſite for my demonſtration was now complete, and independent of all appeals to conſciouſneſs: for the reſult, on either of the only two poſſible ſuppoſitions with reſpect to the relation of motive and action, excluding ſelf-governing power in the perſon, might eaſily be brought to the teſt of open unequivocal experiment, and compared or contraſted with the reſult in the correſponding caſes of the relation of phyſical cauſes applied to lifeleſs bodies.

The relation of motive and action muſt be ſuch, that they are either conſtantly or not conſtantly conjoined. But the principle of the abſolute irreſiſtible force of motives, or the want of ſelf-governing power in the perſon, implies, by neceſſary inferences, on either of thoſe ſuppoſitions with reſpect to motives, concluſions that are falſe or abſurd. Therefore this principle, from which, along with a true one, falſe concluſions are deduced, muſt itſelf be falſe.

In tracing the neceſſary inferences from that principle, firſt on the one and then on the other ſuppoſition with reſpect to the relation of motive and action, I have been obliged to employ mathematical reaſoning. This on a metaphyſical ſubject muſt appear extraordinary at leaſt, if not abſurd. Some have objected to my reaſoning becauſe it was mathematical; others becauſe it was not. It may fairly be preſumed, that both objections cannot be well founded.

Having no ambition to diſpute about a word, and having, in the courſe of my Eſſay, expreſſed very fully my ſentiments with reſpect to the nature and peculiar advantages of mathematical demonſtration, and having given my reaſons for thinking that my argument is eſſentially of that kind, I need not here enter on any controverſy about it. My application of mathematical reaſoning is not ſo new, nor ſo ſingular, as may at firſt be thought; and even that part of it which is really new in kind, and therefore the moſt liable to ſuſpicion, is ſo near akin to what is implied

in

in the *Principia* of NEWTON, that not only the coincidence between them is perfect, but his fundamental propoſition, the firſt Corollary from the Three Laws of Motion, is eaſily reſolvable into, or, in other words, demonſtrable from, thoſe mathematical principles of the relation of cauſe and effect in phyſics which I point out.

This coincidence cannot be accidental; for there is nothing accidental in the connections of mathematical truths: And I hope it will procure for my argument that *attention* from men of ſcience, and that *rigorous examination*, which are all that I aſk for it. It certainly has no pretenſions to any favour; and I know well, that there are in the world ſome very acute and ſome very angry philoſophers, from whom it can expect no quarter.

The mathematics which I employ will not, I truſt, be unintelligible or difficult to any perſon, however little uſed to mathematical reaſoning; as every general abſtract propoſition, and even every expreſſion, which I employ, is fully explained

plained in common language, and minutely illuſtrated by particular examples from phyſics. I wiſh it alſo to be underſtood, that I employ mathematics in my Eſſay merely as an *inſtrument*, to aſſiſt, direct, and regulate the train of thought requiſite for my purpoſe; but by no means as a perfect *machine*, the dexterous management of which may *almoſt* ſuperſede the operation of thinking; which, if I miſtake not, is very nearly the caſe with a great deal of algebraical calculation, as well as with the rules and operations of common arithmetic.

For the edification of *one* good Mathematician of my acquaintance, who cannot be reconciled to my mathematics, and yet either cannot or will not refute them, I quote the following paſſage from the writings of one of the greateſt Mathematicians that Europe has produced.

L'eſprit qui ne reconnoit le vrai que lorſqu'il en eſt directement frappè, eſt bien audeſſous de celui qui ſait non ſeulement le reconnoitre de prés, mais encore le remarquer et

et le preſſentir dans le lointain a des characteres fugitifs. C'eſt la ce qui diſtingue principalement l'eſprit geometrique, *applicable a tout, d'avec l'eſprit purement* geometre, *dont le talent eſt reſtreint dans une ſphere etroite et bornée. Le ſeul moyen d'exercer avantageuſement l'un et l'autre, et de les faire marcher comme d'un pas egal, eſt de ne pas borner ſes recherches aux ſeuls objets ſuſceptibles de demonſtration; de conſerver a l'eſprit ſa flexibilité, en ne le tenant point toujours courbé vers les lignes et les calculs, et en temperant l'auſterité des mathematiques par des etudes moins ſéveres; de s'accoutumer enfin a paſſer ſans peine de la lumiere au crepuſcule.*

D'ALEMBERT, *Elemens de Philoſophie: Melanges, vol.* 4. *pag.* 43.

The merit, or demerit, of the ſingular mode of reaſoning and illuſtration which I have employed in aſcertaining the difference between the relation of motive and action and that of cauſe and effect in phyſics, can be judged of by thoſe only who have carefully peruſed and impartially conſidered both my argument and the ſubject

ſubject itſelf. But even from this ſhort account of it, it will be evident to every perſon, that my Eſſay muſt be either a ſtrict demonſtration of the point that I undertake to prove, or it muſt be arrant nonſenſe; and nonſenſe of ſuch a ſtrange and extravagant kind, as no mortal ever thought or ever dreamed of before.

There can be no medium; for there are no degrees of neceſſary connection or neceſſary truth; nor indeed, ſtrictly ſpeaking, are there any degrees of certainty. It is only of probability that the number of degrees is almoſt infinite. Mathematical demonſtration, or any reaſoning aſſuming the name and form of it, as certainly as Poetry, *Si paullum ſummo diſceſſit, vergit ad imum.*

It will eaſily be believed, that no man whatever, and more eſpecially that no man whoſe fame and fortune depend chiefly on his credit as a man of ſcience, would venture to publiſh ſuch a work, without taking every poſſible precaution to be aſſured that his argument was the demon-

demonſtration which he took it for. And for my own part, I will fairly acknowledge, that, however unworthy I may be, in point of mathematical genius and knowledge, to bear the name of GREGORY, I ſhould yet be very ſorry to diſgrace my name, by offering, as a ſtrict mathematical demonſtration, what was a mere paralogiſm.

As the precautions which I have taken in this reſpect have been very extraordinary, and, as I think, very complete; and as, far from being aſhamed to have taken them, I ſhould have been much aſhamed to have neglected them on ſuch an occaſion, I think it proper to mention what they have been.

After conſidering by myſelf the argument and illuſtrations in every point of view, and trying them in every way that I could think of, for more than a twelvemonth, without being able to diſcover any fallacy in them, I ventured to communicate the principle and general tenor of them to a friend, of whoſe talents and

knowledge I had, as all who know him have, the higheſt opinion; who was well accuſtomed to mathematical, phyſical, and metaphyſical inveſtigations; who had been, and actually was, engaged in ſome philoſophical ſpeculations, very near akin to my own; and whom I knew to be a man of candour, not only on all ordinary ſubjects in ſcience, but even on this very tender and keenly-controverted point; with reſpect to which, I believe, he inclined to the opinion oppoſite to mine, the arguments in favour of which, he acknowledged, appeared to him very plauſible and ſtrong, and not eaſily, if at all, to be anſwered; while yet he owned, that they did not fully command his belief, nor enable him to ſhake off the common and natural perſuaſion of the liberty of human actions, eſpecially in ſo far as related to the principles of morality. He apprehended the nature and force of my mode of reaſoning and illuſtration, at once, when they were firſt mentioned to him; ſcarce needing the aid of any reference to NEWTON's *Principia*, which I knew to be quite familiar to him. He ſeemed to be ſtruck with my

my view of the ſubject, and acknowledged that he thought it ſound philoſophy. I believe, however, his good opinion of it was ſomewhat ſhaken when he ſaw afterwards how far it was to be carried, and how it was to be applied in different ſuppoſeable caſes. Yet though, in the courſe of the laſt eight years, I have had frequent occaſion to converſe with him about it, and to reviſe with him different parts of the reaſoning and illuſtration, he has never yet given me any objections, either to the validity of the one, or to the aptneſs and fairneſs of the other; which I am ſure he would have done, if he had diſcovered any ſuch objections. I am ſure likewiſe that he underſtands it perfectly, and could carry on the ſame mode of reaſoning himſelf, if there were occaſion; for I have obſerved repeatedly, that, when I mentioned to him various objections that different perſons had made to my Eſſay, he gave at once the ſame anſwers to them that I myſelf had given, or was to give.

Encouraged by the reception my mode

of reaſoning met with on this firſt trial, from one whoſe judgement and candour I reſpect very highly, I put in writing the principal part of the argument, and ſome of the moſt neceſſary illuſtrations of it, which, in the courſe of the laſt eight years, I have ſubmitted to the conſideration of more than *Thirty* different perſons; all of them men of reputed good ſenſe and liberal education, all of them accuſtomed to ſcientific reſearches, either in mathematics, in phyſics, or in metaphyſics, and many of them already of diſtinguiſhed eminence as men of ſcience, and others of them, from their talents, and the uſe which they make of them, very likely ſoon to become ſo. Some of theſe perſons have eaſily apprehended the nature and ſeen the force of my peculiar mode of reaſoning, and have fully acquieſced in my argument, as being the demonſtration which I ſuppoſed. Others of them have found difficulty in apprehending a mode of reaſoning ſo new to them; and, after conſidering it attentively for a long time, have ſuggeſted to me various objections againſt it; all of which I have been able eaſily

eaſily to anſwer, I believe to their ſatiſfaction; and certainly in ſuch a way that I ſhould willingly print their objections, with my anſwers to them, in illuſtration of my argument. Others of them, who owned they ſaw no fallacy in my reaſoning, and could think of no valid objection to it, have declined giving any decided opinion on ſuch a controverſy. And ſome of them, who fully underſtood and acquieſced in my mode of reaſoning, have taken the trouble of ſtating to me ſome ſuch objections as they thought moſt likely to occur, and to be urged againſt it. Moſt of theſe objections I had foreſeen, and was prepared for; and all of them were ſuch as I could eaſily anſwer, ſo as to convert them into illuſtrations of my own argument.

Next I proceeded to ſhew the Eſſay in queſtion to ſeveral perſons of acknowledged talents and liberal education, and well accuſtomed to ſcientific reſearches, and of whoſe acuteneſs in reaſoning I had the higheſt opinion, founded on much experience and intimate acquaintance with them;

them; whom I knew to be keen aſſertors of the doctrine of Neceſſity; and who, I was ſure, would be very able, and very willing too, both for my ſake and for the ſake of their favourite ſyſtem, to point out the fallacy of my argument, if it were fallacious. If MR HUME had been alive, I ſhould have ſubmitted it to his reviſion, as I have done to that of *every* perſon of my acquaintance whom I knew or ſuppoſed to be admirers of his philoſophy. ——The circumſtances of this mode of reviſion and trial, and the reſult of it, have been fully mentioned already (p. clix. of this Introduction), and need not be repeated.

Now, after all theſe precautions and trials, in the courſe of which it may be obſerved, that I have moſt religiouſly complied with the golden precept, *Nonum prematur in annum*, it will not, I hope, be thought either very wonderful, or very preſumptuous in me, when I offer my argument to the public, as a *Demonſtration*, of the ſame kind, and the ſame force, with thoſe

thoſe of pure geometry, and of mechanical philoſophy.

Still, however, as I neither arrogate any infallibility to myſelf, nor ſuppoſe it to belong to men who grow north of the Tweed, I was anxious, before I ſhould publiſh my Eſſay, to ſubmit it to the reviſion of ſome philoſophers, whoſe underſtandings had been matured by the brighter ſuns of more favoured regions; and in this view, I could think of none more fit for my purpoſe than the late DR PRICE, and the living DR PRIESTLY, both of whom I knew had fully conſidered the ſubject, and yet remained of diametrically oppoſite opinions concerning it.

I had formerly had the pleaſure of ſome little perſonal acquaintance with both theſe philoſophers; and partly on the ſtrength of that acquaintance, but ſtill more in conſideration of their being much intereſted and engaged in ſcientific purſuits very ſimilar to mine, I took the liberty to ſend to each of them a copy of my Eſſay, as ſoon as it was printed; accompanied with

with a letter, reminding them of former acquaintance; explaining to them the nature, plan, and reſult of my inveſtigation; requeſting them to peruſe it with attention, and to communicate to me any remarks, and particularly any objections to my mode of reaſoning, that ſhould occur to them; to all which remarks or objections I promiſed to pay the utmoſt regard; ſo far even as to acknowledge any objection to be valid, and of courſe to ſuppreſs my Eſſay as unworthy to be publiſhed, if I could not completely anſwer ſuch objection, ſo as to convert it into an illuſtration of my own argument, and publiſh it accordingly along with my own treatiſe.——This was about Midſummer 1789.

About four months afterwards, I received from DR PRICE a letter, containing ſeveral good remarks on my Eſſay, and expreſſing his approbation of it, and his acquieſcence in my ſuppoſed demonſtration.——This was juſt what I expected.

I was not ſo unreaſonable as ever to expect

pect the ſame kind of anſwer and approbation from DR PRIESTLY: for, little as I know of him perſonally, I was not ignorant of his literary character, and eſpecially of that peculiarity of his mental conſtitution, which DR PRICE (in his letter to me about my Eſſay) hath modeſtly, but emphatically, termed *his inſenſibility to argument*. Beſides, I knew very well that DR PRIESTLY had gone ſo far in the controverſy, that he *could not retract*, being pledged beyond all poſſibility of redemption, as many others have been, not only in point of underſtanding, but of veracity, to maintain to the laſt, right or wrong, that opinion which he had *erroneouſly profeſſed* to believe. But on this very account, it was the more incumbent on me to give him the fulleſt and the earlieſt opportunity of conſidering and refuting, or rather of preventing, any unjuſt or erroneous charge, or any improper evidence, from being brought againſt him and his philoſophy. To have failed in this reſpect, I am ſenſible, would have been in the higheſt degree illiberal and diſhonour-

able on my part; as I told him in my firſt letter which accompanied my Eſſay.

I own, too, that I fully expected that he would peruſe my Eſſay, and ſtate his objections to it; and any feeble or uncandid objections from him would have been much more gratifying to me, and a better teſt of the validity of my reaſoning, than his approbation and acquieſcence would have been.——It did not occur to me that DR PRIESTLY would have ſought, or could have found, an expedient, to avoid either acknowledging the validity of my argument, or ſtating his objections to it. But ſuch an expedient he hath found; and *valeat quantum valere poſſit.*——How I have acted, and indeed how I have thought, with reſpect to DR PRIESTLY, on this occaſion, and what uſe he hath made of the opportunity afforded him, will ſufficiently appear from the following ſpecimen, the chief and concluding part of our correſpondence.

TO

To Dr PRIESTLY.

"SIR,

You will remember, I preſume, that, about two years ago, I ſent you a copy of my Eſſay on the Difference between the Relation of Motive and Action and that of Cauſe and Effect in Phyſics; on which Eſſay I requeſted you to favour me with your remarks.

I received, in due courſe, your very polite letter, in which you acknowledge the receipt of my Eſſay, and of my letter that accompanied it; and expreſs your regret that it had not come to your hands during your diſcuſſion of the doctrine of Neceſſity; and mention the many important literary occupations in which you were at that time engaged, and your doubts of your having leiſure, in the courſe of that

year, or before the time at which, as I told you, I meant to publiſh my Eſſay, to give ſufficient attention to a ſubject on which you had long ceaſed to read or to think; or, as you were pleaſed to ſay, to do juſtice to ſuch a work as mine; but at the ſame time gave me hopes, that, if you found leiſure to peruſe it, you would communicate to me any remarks on it that ſhould occur to you, and appear to you to be of importance.

I was in no hurry to publiſh my Eſſay; and I truſted that you would have curioſity enough to look into it; and, if you did, I was ſure you would find at leaſt one important particular in it, which would deſerve your attention, and appear to you to require an immediate and explicit anſwer.

About four months afterwards, I received a letter from your friend MR COOPER, in which he informed me, that you, not having leiſure to fulfil the requeſt of my letter, had ſent my Eſſay to him, and had begged of him to peruſe it, and to make his

his remarks on it; and he added, that he had peruſed it, and underſtood the general nature of the arguments, and did not apprehend that he ſhould have occaſion to occupy much time in expreſſing the objections that occurred to him.

This letter I anſwered in the beginning of November 1789; thanking MR COOPER for the trouble he had taken, and for his obliging offer and intention; and aſſuring him, that I ſhould pay all poſſible regard to his obſervations.

Having heard nothing more from MR COOPER in the courſe of ſix months, and ſuſpecting that my former letter had never reached him, I wrote to him again, (June 1. 1790.), to the ſame purpoſe as before. In anſwer to this, I received from him a ſecond letter, in which he acknowledges having received my former letter, and mentioned various ſatisfactory reaſons for his delay in ſending me his remarks on my treatiſe, and repeated his promiſe of ſending me his remarks in the courſe of a few months.

Twelve

Twelve months and more are now elapſed, and yet I have heard nothing either from him or you.

It would be needleſs, and indelicate, to importune Mr COOPER any more on ſuch a ſubject. He has read my Eſſay, and underſtood it; he muſt know perfectly whether any valid objections againſt it have occurred to him; and from the very peculiar nature of my reaſoning on the one hand, and the tenor of his letters on the other, I cannot doubt, that if any objections had occurred to him, which he himſelf thought valid, or decently tenable, he would have communicated them to me.

If I were ſure that you were as well acquainted with my Eſſay as he is, I ſhould have ſpared both you and myſelf the trouble of this letter. But as I ſuſpect you have not read my Eſſay, and are not in the leaſt aware of ſome things in it which it behoves you much to know, I take the liberty once more to call your attention to it; and I think it better to do ſo before it be

be publiſhed, than after; that you may have an opportunity, either of obviating and preventing any unfavourable remarks or concluſions with reſpect to yourſelf and your philoſophy, which it may contain; or elſe of being prepared to anſwer and refute them, as ſoon as they come forth.

You will ſee, if you peruſe my Eſſay, what I think I told you in my former letter, that my reaſoning is, as I conceive, ſtrictly ſpeaking *demonſtrative*.

Every demonſtration, as I preſume you well know, muſt conſiſt of two parts, which alone are eſſential to it. Theſe parts are, firſt, certain ultimate principles, which are clearly perceived as ſelf-evident neceſſary truths, and are called *Axioms*; ſecondly, certain neceſſary inferences deduced, according to the ſtrict rules of logic, from ſuch axioms, and ſome hypotheſes, or caſes put.

Theſe two eſſential parts of demonſtration you will find in my argument. If it be

be juſt, it is concluſive, as being the higheſt kind of evidence which human reaſon knows. If it be not juſt, it muſt be nonſenſe; and it may eaſily be detected, by ſhewing the error, if there be any error, in the axiom aſſumed, or in the logical inference from it and the caſe put: the former being conſidered as the *Major* and the latter as the *Minor* propoſition of a regular ſyllogiſm. Into ſuch ſyllogiſms the whole of my demonſtrative reaſoning may eaſily be reſolved.

But though I have made many trials, and have met with many perſons who were unwilling to admit my concluſion, and eager to evade my argument, I have as yet found no perſon who *would* deny my axioms, or who *could* point out any error or fallacy in my inferences from them.

My demonſtration is indirect, or *ad falſum et abſurdum*. The principle with reſpect to the motives and actions of men, from which I undertake to reaſon, by neceſſary conſequences, to concluſions that

are

are either intuitively abſurd, or experimentally falſe, you will find to be the very ſame that you, and MR HUME, and many others, have been accuſtomed to aſſert under the name of the Doctrine of Neceſſity; to wit, that the relation of motive and action is either preciſely or very nearly the ſame with that of cauſe and effect in phyſics; at leaſt that there is no liberty, or independent activity, or ſelf-governing power, in a living perſon, any more than in a lifeleſs body; and that the influence or force of motives is abſolute and irreſiſtible, like that of phyſical cauſes.

The inferences which I have deduced from this principle, as neceſſary conſequences, are not only experimentally true, but familiar and well known, with reſpect to phyſical cauſes and effects in lifeleſs bodies; and I am convinced that you, or any perſon of competent judgement and knowledge, would think very unfavourably of the veracity, as well as of the underſtanding, of any man who ſhould doubt, or profeſs to doubt of them, in the caſe of

phyſical cauſes applied to lifeleſs bodies; as, for example, in the inſtance of equal weights put into the oppoſite ſcales of a balance; which is your common and favourite illuſtration.

All my inferences are of the ſame kind with the one relating to the reſult in that inſtance; and moſt of them may be tried experimentally with a balance, and the reſt of them with a billiard-ball, or a ſtone, or with any other lifeleſs body, as well as with a living perſon. They all differ from the inference reſpecting the caſe of a perſon under the influence of two equal and oppoſite motives at the ſame time, in this particular only, that they admit of no appeals to conſciouſneſs, and that they exclude all arbitrary hypotheſes to account for the reſult not being found experimentally the ſame in living perſons and in lifeleſs bodies. Such appeals, and ſuch hypotheſes, you well know, are always ready to account for the failure of the inference in the caſe of equal oppoſite motives, the aſs between two bundles of hay, &c.

After

After the utmoſt attention that I have given to this ſubject for many years, my inferences ſtill appear to me as they did at firſt, ſtrictly neceſſary conſequences of the principle from which I have deduced them; and they have appeared ſo to many other perſons, well qualified to judge of them, who, at my deſire, have taken the trouble to examine them with care. They have appeared ſo to your friend the late DR PRICE, to whom I ſent a copy of my Eſſay at the ſame time that I ſent one to you; and from whom I received, about four months after, a letter, containing ſeveral remarks on my argument; which remarks convinced me that he had conſidered it with attention, and had underſtood it perfectly; and expreſſing, in the moſt explicit terms, his acquieſcence in the validity of my demonſtration.

Such are the reaſons I have for thinking my argument juſt and concluſive; but I have uniformly found hitherto, what I take to be unparalleled in the annals of ſcience, and not to be accounted for but on one very unfavourable ſuppoſition,

that thoſe who aſſert moſt ſtrongly their belief of that principle from which I reaſon, perceive intuitively, that the inferences deduced from it are falſe; though they are evidently poſſible, and though the correſponding inferences from the ſame principle, with reſpect to ſimilar caſes of the application of phyſical cauſes to lifeleſs bodies, are generally known, and are by themſelves acknowledged to be true; and though they can point out no error in the demonſtration by which they were deduced from, or ſhewn to be neceſſarily implied in, that principle which they profeſſed to believe.

How is this to be accounted for? Do you think it *can* be accounted for conſiſtently with the ſuppoſition of ſincerity and veracity in thoſe who act in ſuch a manner? Would *you* act in ſuch a manner? What would you think of me if I were to do ſo?

As I wiſh to be fully underſtood on this point, and yet ſhould be ſorry to give needleſs offence to any individual, or to any

any ſet of men, I ſhall ſuppoſe myſelf in the embarraſſing and uncreditable ſituation of denying the neceſſary conſequences of a principle which I had formally and ſtrongly aſſerted; and I ſhall take as the ſubject of my ſuppoſed belief a ſophiſm which no body now maintains, but which not one in ten thouſand of mankind can detect, and which, like the doctrine of Neceſſity, I conceive to be repugnant to the indefeaſible laws of human thought, and therefore incredible, even though it could not be refuted.

I ſhall ſuppoſe, that at an early period of life, when my reaſon was weak, and my credulity and vanity ſtrong, I had met with the ancient paradox, that *Achilles*, though ſwift of foot, could *never* overtake an old man, who went but half as faſt as he did, and was but a ſhort diſtance before him; for that while *Achilles* went that diſtance, the old man would go the half of it, and while *Achilles* went the half, the old man would go the quarter of that diſtance; and ſo forth; ſo as to be ſtill before him.

I ſhall ſuppoſe, that I had neither underſtanding enough to detect the ſophiſm, nor knowledge enough of language to perceive the inaccuracy of the expreſſion on which it depended; and that I had either ſo little mathematics, or ſo much metaphyſics, as not to underſtand, nor be capable of learning, how to ſum up an infinite ſeries; and that I boldly profeſſed, that I was convinced by that argument, and declared that I did not believe that *Achilles* could *ever* overtake the old man; that I formally renounced the vulgar notions and belief of motion, and time, and ſpace, and expreſſed great contempt for the underſtanding, and ſome diſtruſt of the veracity, of ordinary men who profeſſed to believe in ſuch things; juſt as the aſſertors of the doctrine of Neceſſity have done with reſpect to thoſe who maintained the liberty of human actions.

I ſhall ſuppoſe, that I had proceeded in this ſtyle for many years, bidding defiance to all arguments againſt my ſyſtem, and fancying myſelf a very great philoſopher,

pher, and getting many diſciples to adopt and to maintain my doctrine; juſt as the aſſertors of the doctrine of Neceſſity have done.

I ſhall ſuppoſe, that, with all theſe profeſſions, my conduct, even in caſes relating to motion, was preciſely the ſame with that of men who believed, or profeſſed to believe, in motion, and time, and ſpace; that I was accuſtomed to walk and ride like other men, and, when I did ſo, to overtake thoſe who went ſlower, and to be overtaken by thoſe who went faſter than I did; in ſhort, that I always acted as much like other men as the aſſertors of the doctrine of Neceſſity do; and that, when any queſtions were put to me about this inconſiſtency between my profeſſions and my actual conduct, I gave the inquirers plenty of words, but not very intelligible, and ſtill leſs ſatisfactory to them; juſt as the aſſertors of Neceſſity do to all inquirers about their faith and their actions.

I ſhall ſuppoſe, that at laſt ſome well-meaning

meaning plain man undertook, not only to ſhew the error of my doctrine, but to prove that I had never believed it; juſt as I have done with reſpect to the aſſertors of the doctrine of Neceſſity.

I ſhall ſuppoſe, that the plain man proceeded as follows: "You ſay very right-"ly, that while *Achilles* went the diſtance "which was at firſt between him and the "old man, the latter would go half that "diſtance, and be ſtill before him; and "that while *Achilles* went this diſtance, "the half of the original diſtance between "them, the old man would go the half "of it, ſo as to be ſtill before him: Con-"ſider then where *Achilles* would be with "reſpect to the old man, when he (*Achil-"les*) had gone double the original diſ-"tance, and when the old man, conſe-"quently, had gone half as far; that is, "had gone a diſtance equal to that origi-"nally between him and *Achilles*."

I ſhall ſuppoſe, that whenever this was ſtated to me, I became very angry; that I would neither admit the obvious concluſion,

ſion, nor give up my doctrine, nor ſhew any error in the reaſoning; but declared, in general, that it was not applicable to the ſubject, and that it was treating me like a child, or an idiot, to propoſe ſuch an argument to me; juſt as ſome very zealous aſſertors of your doctrine have done with reſpect to my argument againſt it.——

Truth, it has been ſaid, is nothing but conſiſtency; which is a doctrine, or rather a paradox, that I do not chooſe to maintain. But you and every perſon muſt acknowledge, that conſiſtency is one of the chief teſts of truth: whatever is conſiſtent with itſelf, and with known truths, is generally held to be true; whatever is found inconſiſtent with itſelf, and with known truths, is always held to be falſe. This indeed, as I preſume you know, is the very teſt that MR HUME, whoſe ſyſtem you have ſo zealouſly adopted, propoſes for the truth of the doctrine of Neceſſity; and I acknowledge it to be a fair one.

With equal certainty I hold, as I believe all mankind do, conſiſtency to be a good teſt of veracity; and, at leaſt, inconſiſtency is always held as complete evidence of falſehood. The uſeful art of croſs-examining witneſſes depends on this principle. If you and I were examined as witneſſes in a court of juſtice, and after ſwearing poſitively to any fact, ſhould fall into inconſiſtencies with reſpect to it, (for example, as to the neceſſary relations of time, place, or quantity, connected with it), and ſhould deliberately perſiſt in ſuch inconſiſtencies, we ſhould ſtand convicted of perjury.

Nor is the caſe different, nor has it ever been ſuppoſed to be different, in ſcience. If it were poſſible for men *bona fide* to deny the neceſſary conſequences of a principle which they believed, (when ſuch conſequences were ſhewn to be implied in it), demonſtration would be impoſſible, a ſyllogiſm would be a kind of abſurdity, and the ſcience of Logic as arrant an impoſition on mankind as Magic or judicial Aſtrology.

The

The only uſe that I know of what is commonly called Logic, I mean the analyſis and whole doctrine of Syllogiſm, is, to enable us to detect any error or fallacy in a ſtrict argument or ſuppoſed demonſtration. If you can do ſo with reſpect to mine, you will find me ſtill ready to acknowledge your ſuperiority in reaſoning, to thank you for the very great favour you do me, and to ſuppreſs my work. If you cannot find any error in my reaſoning, I muſt expect of you, as a man of ſenſe and candour, that you will admit my inferences, I mean as neceſſary conſequences of your own principle; which conſequences you expect to find true upon trial; and that you will agree to try them experimentally, and to abide by the reſult.

I ſhould be very ſorry to do you any injuſtice, or even to fail in that reſpect to you, to which your character, and your zeal and activity in the purſuits of phyſical ſcience, well intitle you. But it is fair, and it is neceſſary, on my part, to warn you, that, by the publication of my Eſſay,

you will find yourſelf loudly called upon to vindicate your character, not merely in point of underſtanding as a philoſopher, but in point of probity and veracity as a man ——My Eſſay, as you will perceive by the tenor of it, is given, not merely as a demonſtration that the doctrine of Neceſſity is erroneous and abſurd, but as a proof, (as complete and deciſive as ever was or ever can be given of *mala fides* in any caſe), that few, if any, of thoſe who aſſerted it had really believed it; and conſequently that moſt or all of the aſſertors of it had been guilty of a moſt ſhameful impoſition on mankind.

You cannot be indifferent to ſuch a charge. You cannot fail to know, that not to anſwer and refute it, is to acquieſce in it. It cannot be doubted, that in the courſe of two years you might eaſily have found time to conſider ſuch a work as mine, and either to diſcover the error, if there be any error, in my inferences from your own principle, or to perceive that they are juſt inferences, fit to be believed,

ved, and likely to be found true on experiment.

I ſhall mention in my Introduction, of which an abſtract or perhaps a complete copy of this letter will form a principal part, what extraordinary precautions I have taken to be aſſured that my reaſoning is valid and concluſive, and what care I have taken to avoid doing injuſtice to thoſe whoſe ſyſtem I undertake to refute, and particularly to you.

My Eſſay will be publiſhed (unleſs you can ſhew me that it is erroneous) in the beginning of winter: any remarks or objections that you or your friend MR COOPER ſhall favour me with, on or before the firſt of September, ſhall have a place, either in the Introduction or in the Appendix to my Eſſay."

EDINBURGH,
June 24. 1791.

The firſt of September, and the laſt of December too, are now paſt, and I have received

received no remarks on my Eſſay, and no objections to my argument, either from DR PRIESTLY or from MR COOPER; but I received from the former a letter, of which the following is a copy.

DR PRIESTLY's ANSWER.

"SIR,

I AM truly concerned that you ſhould have had occaſion to take the trouble of writing ſo long a letter as yours of the 24th inſtant. MR COOPER ſhould not certainly have promiſed to write to you on the ſubject of your book, without doing it; but I cannot abſolutely condemn him unheard. I ſhall immediately tranſmit to him this letter of yours; and I hope it will induce him to ſend you the remarks he promiſed. But as many things may render this uncertain, I would adviſe you to publiſh your book without

without any further delay. Your attention to us has been greater than we were entitled to.

Two of my friends, in my opinion good judges of the ſubject, and who have read your book, expreſs no leſs confidence in the weakneſs of your argument, than you do in the ſtrength of it. But let the public ſee it, and they will form their own judgement, both of *it*, and of our conduct with reſpect to the author.

To me, I fairly own, your propoſal appears in the ſame light as to re-examine the doctrine of Tranſubſtantiation, or to defend a propoſition in the firſt book of EUCLID, in the demonſtration of which a perſon ſhould now pretend that he had diſcovered a fallacy. In either of theſe caſes, would you think it worth your while, if you had any important purſuit in hand, to give much of your time to them?

As to your calling upon me to vindicate my "probity and veracity," and to defend

defend myſelf from the charge of "*mala fides*," and of being "guilty of a moſt ſhameful impoſition on mankind," to which you ſay "I cannot be indifferent," I do aſſure you, that I have been ſo much uſed to charges of this nature, that I am perfectly ſo. I am myſelf ſatisfied with what I have written on this ſubject; and I have long been in the habit of making myſelf eaſy as to every thing elſe.

I am,

SIR,

Your very humble ſervant,

(Signed) J. PRIESTLEY.

BIRM. *June* 30. 1791.

P. S. MR COOPER has your book; and as we are at a great diſtance from each other, I have had no opportunity of looking into it."

ON

On this letter I muſt beg leave to make a few remarks.

In the firſt place, I muſt own, that the reſemblance, to which Dr Priestly alludes ſo confidently, between the doctrine of Tranſubſtantiation and the popular perſuaſion of the liberty of human actions, does not ſtrike me; and one great difference between them is very obvious; namely, that the latter is general, and natural, and, I believe, indefeaſible among mankind; while the former is found only in ſome part of them; and even among theſe is not natural, but produced by artificial inſtruction, and appears repugnant to their ſenſes and to their reaſon, and reſts entirely on the authority of Prieſts and Theologians, and on the peculiar meaning which they give to a paſſage of the Holy Scripture; — juſt like Dr Priestly's own Theological opinions and diſcoveries.

I am nowiſe qualified nor diſpoſed to judge, whether the doctrine of Tranſubſtantiation, or Dr Priestly's peculiar

doctrines in Theology, be moſt rational, and moſt conducive to the temporal and to the eternal intereſts of mankind. But I am very ſure that the doctrine of Tranſubſtantiation has nothing to do with the philoſophical queſtion that I have been conſidering; and I am equally ſure, that it is not only very indecent, but highly imprudent, for DR PRIESTLY to allude to it, or to any other religious opinion, however erroneous he may think it, as a ſubject of contempt and deriſion. He knows not how ſoon he himſelf may be maintaining that very doctrine of Tranſubſtantiation, as zealouſly as ever he did that of Neceſſity. Many ſtranger things have happened, and happen every day, without occaſioning much ſurpriſe among men of ſenſe and obſervation. The lucky *diſcovery* of two or three new meanings to as many old texts would bring it about at once, by giving him a new creed: and it is well known, that though his creed be always odd, and always ſcanty, and always changing, yet it is always ſtrong: *Quicquid credit, valde credit.*

In

In the ſecond place, I muſt own, that I m equally at a loſs to perceive that re-emblance, to which he alludes, between he doctrine of Neceſſity and a propoſi-ion in the firſt book of EUCLID; and I erceive very plainly ſome important dif-erences between them. One of the moſt bvious of theſe differences, which I ſhould hink DR PRIESTLY, whether he under-ands the difference between demonſtra-ve and inductive reaſoning or not, might afily have perceived, is, that *all* Mathe-naticians have uniformly agreed, and have ven found it impoſſible to differ, in their pinions with reſpect to the propoſitions nd the arguments in EUCLID; while, on he contrary, Metaphyſicians, ſeemingly qually well qualified, both by nature and ducation, to judge of the ſubject of their eaſonings, have very generally differed, nd have even found it impoſſible to agree, n their opinions about the doctrine of leceſſity.——Was HOBBES better quali-ed to judge of it, or more worthy of cre-it, than JOHN LOCKE? LEIBNITZ than ING? MR HUME than DR REID? DR RIESTLY than his friend DR PRICE?

Have Father BUFFIER, or Father BOSCOVICH, or M. D'ALEMBERT, acquieſced in the doctrine of Neceſſity? Have even the majority of philoſophers admitted it? Did SOCRATES, or PLATO, or ARISTOTLE, admit it? Are philoſophers better qualified to judge of it than mankind in general, who uniformly reject it with contempt?

"In a queſtion about hay, there is no appeal from the judgement of my horſe," was the anſwer of a learned judge to an impudent rogue of an innkeeper, who would maintain that his hay was good, though the horſe would not eat it. I think the argument a good one; and on the ſame principle I conceive, that, in a queſtion about *human thought*, there lies no appeal from the general voice of mankind.

They will liſten with attention and inſtruction to one who will explain to them the ſtructure of the eye, the nature and uſes of its various humours, and the formation of an inverted image on the *retina*; and

and they will acknowledge, that the perſon who inveſtigated theſe things was really a philoſopher: but if their inſtructor ſhould proceed to tell them, that, when they looked at the objects around them, they ſaw only the inverted images of them on the bottoms of their own eyes; or that by means of theſe inverted images they ſaw the real objects, but inverted; and then, by a proceſs of reaſoning, judged them to be erect, like DES CARTES's blind man with his croſs ſticks; they would ſoon diſcover that he was playing the fool. And if he ſhould venture to aſſert that ſuch was the caſe with himſelf, that he *ſaw* thoſe images in the bottom of his own eye, and *ſaw* all things inverted, and only inferred or judged that they were erect, they would naturally, and I think very rightly, conclude, that he was playing the knave, and was ſaying the thing that was not.——So eaſy it is, even in caſes in which they appear to be moſt intimately blended, to diſtinguiſh between phyſical and metaphyſical ſcience, and to judge of each of them by its own proper teſt.

DR

DR PRIESTLY, in his letter to me now under conſideration, hath very candidly mentioned, that he is "much uſed to charges of *mala fides*, and groſs impoſition on mankind," &c. This is indeed a great misfortune, and one of a very peculiar kind; but it is lucky, that by being accuſtomed to it, he is able to make ſo light of it. *Leve fit quod bene fertur onus.*

I cannot wonder at any thing ſo natural as his having had ſuch charges brought againſt him; for indeed I think it ſcarce poſſible he ſhould have eſcaped them: but I wonder greatly that he never diſcovered, nor thought of inquiring, how that came to paſs. They have not in general been brought againſt other philoſophers: they are not legally, nor even by the courteſy of England, attached to the ſtate and degree of Philoſopher; like the appellation of Right Honourable, which we give to a Peer, or Right Reverend, which we give to a Biſhop. No ſuch ſuſpicions were ever entertained of SIR ISAAC NEWTON, tho' he lived more than fourſcore years in the world, and dealt much in diſcoveries. No

ſuch charges have been brought againſt Dr Reid, though he has lived almoſt as long, and has dealt much in metaphyſics. But all philoſophers who will inſiſt on making diſcoveries in metaphyſics, and maintaining ſophiſms, (as for example that of *Achilles* and the old man), which mankind in general find incredible, though perhaps they are not able to detect them, muſt expect to meet with ſuch charges, and cannot eſcape them.

A perſon muſt be peculiarly unfortunate, indeed, whoſe probity and veracity are often and generally called in queſtion without ſome reaſon. For my own part, I doubt whether this ever happens: hence the real value of good character. Dr Priestly, I am ſure, notwithſtanding that perfect indifference which he expreſſes to ſuch charges when brought againſt himſelf, would not rely much on the probity or veracity of a perſon who was much accuſtomed to be charged with the want of them; nor on the courage of a ſoldier, nor on the chaſtity of a woman, which had often been called in queſtion by

by thoſe who had opportunities of judging of them.

In Scotland, we are accuſtomed to pay ſtill greater, ſome people will perhaps think too great, regard to the circumſtance of generally bad or ſuſpicious character: we call it *habit and repute*; and our lawyers, an uncharitable ſet of men, not a jot better than their brethren of Weſtminſter-Hall, hold, that the proof of a ſingle act of theft, by a man who was habit and repute a thief, is a kind of proof, that his general character was the reſult of his actual conduct. Our law will even hang a perſon of ſuch a character for a ſingle act of theft, which in another perſon, not of ſuch character, would not be deemed a capital offence. This may be thought carrying the principle too far: for certainly, in every ſyllogiſm whereof the concluſion is hanging, we ought to be very cautious as to the premiſes. But admitting it to be wrong, the reverſe of this wrong will not be right: a man will not ſurely be exempted from the obligation of vindicating his character, nor will he

he be entitled to preſume upon it as firmly eſtabliſhed, becauſe it had often been called in queſtion before; when complete proof of the charges brought againſt it could not be obtained, or had not been produced. Suſpicions may be perfectly juſt, though they cannot be eſtabliſhed by proof; and many perſons have been acquitted on trial merely for want of evidence; that is, not becauſe they were proved innocent, but only becauſe they were not proved guilty. Every ſuch ſuſpicion, and every ſuch acquittal, muſt be conſidered as weighing much againſt the perſon on every ſubſequent accuſation. If the illuſtrious MR BARRINGTON, the laſt time that he appeared at the bar, had told the Court, that he was ſo much accuſtomed to ſuch charges as thoſe brought againſt him, that he was perfectly indifferent to them; whatever credit might have been given to his profeſſions of indifference, I do not think the evidence againſt him would have been in the leaſt weakened; nor would that ingenious perſon have eſcaped the trouble and the

vexation of a voyage to the ſouthern hemiſphere.

If it were not ſo particularly his own caſe, I am convinced that DR PRIESTLY would agree with me, and with the reſt of mankind, in thinking, that the character of a philoſopher, and of every good man, like the wife of *Ceſar*, ought not even to be ſuſpected; and that there muſt be ſomething wrong in the conduct of a perſon, when ſuſpicion falls upon his character.

As to what DR PRIESTLY ſays of his being himſelf ſatisfied with what he has written on this ſubject; he has given ſo many unequivocal proofs of his being himſelf ſatisfied with what he has written on every ſubject; or, more properly ſpeaking, his whole life and writings have been ſo entire and uniform a proof of his enjoying that higheſt of all ſatisfactions, the being ſatisfied with himſelf; that it would be impoſſible, as well as uncandid, to call in queſtion his ſincerity in that ſhort and pithy declaration. I ſhall therefore only

only beg leave to recall to his memory the admonition of the Apoſtle, " Let him that thinketh he ſtandeth, take heed leſt he fall."

I have good reaſon to think, that he will find more difficulty than he is aware of in reconciling his profeſſions with his actual conduct; and his ready admiſſion, and bold aſſertion, of *every* conſequence of the doctrine of Neceſſity, however abſurd, that admitted of appeals to conſciouſneſs, with his immediate and obſtinate rejection (which I am confident will be the caſe) of *every neceſſary* conſequence of it that admits of no ſuch appeal, and muſt be decided by open unequivocal experiment. But that is entirely his buſineſs, and not mine. It is no part of my undertaking to make DR PRIESTLY, or any of thoſe who have maintained the ſame doctrine that he has done, confeſs that they had aſſerted with arrogance a doctrine which they did not believe; nor is it of any conſequence in ſcience to do ſo: but it is of great conſequence in ſcience, chiefly with a view to prevent the conti-

nuance or repetition of the ſame improper conduct in others, to prove that ſuch has been the caſe. And this I undertake to *demonſtrate*.

As DR PRIESTLY is more accuſtomed to metaphyſical than to mathematical ſpeculations, it will not probably appear to him a paradox, or even a matter of doubt, when I ſay, that what we call *Demonſtration*, even in geometry, is not, ſtrictly ſpeaking, a proof of what any thing *is*, but only a full and clear expoſition of what every man of ſound judgement *muſt think and believe* with reſpect to it. If the thoughts and belief of mankind with reſpect to the perception of neceſſary truth in the axioms, and with reſpect to neceſſary connection in every inference from them and the ſeveral hypotheſes, or caſes put, in the propoſitions of geometry, were erroneous, every propoſition in mathematics would be falſe: And if we could think our faculties in thoſe reſpects deceitful, we ſhould reaſonably, and indeed neceſſarily, doubt of every propoſition in mathematics, however clearly demonſtrated. This,

I preſume, is very generally done by thoſe who ſtudy geometry, till they ſee and underſtand the demonſtration of the ſeveral propoſitions which they are taught: but then doubt inſtantly becomes impoſſible. No perſon *can* doubt of a geometrical axiom, or of the validity of a regular ſyllogiſm: No perſon *dare* pretend to doubt of either of theſe things; for if he did, he would inſtantly ſtand convicted of falſehood. When he admits theſe two things at each ſtep of the demonſtration, he at laſt neceſſarily admits that propoſition which was to be proved; but which, when ſtated by itſelf, he might reaſonably have doubted or denied.

Such is mathematical demonſtration; and ſuch is the mode of reaſoning which I have employed in my Eſſay. Dr Priestly *might* have underſtood from my firſt letter, though it was expreſſed in the moſt cautious and delicate terms, and he *muſt* have underſtood, if he had read my book, which he received along with that letter, that my Eſſay contained the moſt complete and rigorous proof of thoſe charges

charges of *mala fides* and groſs impoſition, to which he owns he had been much accuſtomed. But much as he was accuſtomed to thoſe charges, he certainly could not be accuſtomed to that kind of proof of them; for it had never been brought, nor attempted, before: and much as he might deſpiſe the charges when unſupported by proof, he could not deſpiſe that kind of proof of them; for he muſt have known that it is the higheſt kind of evidence that human reaſon has yet diſcovered, or can conceive; and that, if it could not be pointedly refuted, by ſhewing preciſely the error of it, the concluſion muſt remain eſtabliſhed for ever.

There is reaſon to think, that Dr Priestly has little taſte for mathematical reaſoning, or indeed for ſtrict reaſoning of any kind; I mean, reaſoning by neceſſary conſequences; from which I infer, that he underſtands but little of ſuch reaſoning. But I cannot ſuppoſe him ſo ignorant, or ſo incapable of it, as not to perceive a ſimple neceſſary truth, or a ſtrict logical inference, when any ſuch are

are pointed out to him: for that would be to ſuppoſe him incapable of learning even the firſt book of EUCLID. As little can I ſuppoſe him of ſo ſtrange and perverſe a diſpoſition, as to refuſe his aſſent to ſuch a ſelf-evident truth, or ſuch a logical inference, when he perceives and underſtands them. Nor can I doubt, that, in every caſe where he met with that kind of reaſoning, he would perceive the infinite ſuperiority of it to that vague, declamatory, and analogical reaſoning, which has generally been employed by Metaphyſicians, and which he himſelf hath ſo liberally and ſo uniformly employed, in treating of the doctrine of Neceſſity. It is abundantly evident, and will not, I preſume, be denied by DR PRIESTLY himſelf, that he, and that all of them, in treating of it, have attended *ſolely* to the inſtances that favoured, or ſeemed to favour, or might be conſtrued to favour, their opinion; that is, to inſtances of the analogy between the relation of motive and action and that of cauſe and effect in phyſics; overlooking or denying all inſtances, though much more numerous, as well as more

more important in point of reaſoning, (in which indeed they are *concluſive*), that were adverſe to their ſyſtem, and to that analogy.

Truſting to his having that degree of underſtanding and knowledge, of which it would have been unreaſonable, as well as uncandid, nay almoſt impoſſible, to ſuppoſe him deſtitute, and being perfectly indifferent whether he acted candidly or otherwiſe in his remarks on my argument, I was anxious, for reaſons very obvious and already mentioned, that DR PRIESTLY ſhould peruſe my Eſſay, and give me his obſervations on it; or at leaſt that he ſhould have an opportunity of doing ſo. He has had that opportunity, and has it ſtill, and may make uſe of it or not as he pleaſes, and in whatever manner he thinks beſt. I underſtand from his letter, that he will not make any remarks on my argument, or offer any objections againſt it. But I am at a loſs to know, whether I am to underſtand from the poſtſcript, that he had *never* read it, or only that he had not read, nor had an opportunity of reading

reading it, after receiving my ſecond letter. He certainly had an opportunity of reading the book, when he firſt received it, and before he ſent it to MR COOPER.

This circumſtance I take notice of the more particularly, becauſe I conceive, as I think every perſon muſt do who ſhall peruſe my Eſſay with attention, that DR PRIESTLY may have very different reaſons, beſides want of opportunity to read my Eſſay, and confidence in his own opinions, and the reſemblance between the popular notion of liberty and the doctrine of Tranſubſtantiation, and between the doctrine of Neceſſity and the propoſitions in the firſt book of EUCLID, and reaſons much more cogent than any of theſe, for refuſing to make any remarks on my argument, and either to admit it to be valid, or fairly to ſtate his objections to it, and to ſhew in what reſpects he thinks it erroneous.

Theſe ſingular and very cogent reaſons *may*, I think, be pretty well gueſſed at

from what has been already mentioned of the general nature of my reaſoning, of the extraordinary precautions that I have taken to be aſſured that it is valid, and of the reſult of many trials made, by ſubmitting it to the reviſion of ſeveral different perſons, who were as unwilling as he could be to acknowledge the validity of the argument, and to admit the concluſion; and they *muſt* be fully underſtood at once, from conſidering the infinite difference between my mode of reaſoning by mathematical neceſſary conſequences, and the vague, analogical, and hypothetical reaſoning, which has been generally employed by thoſe who maintain the doctrine of Neceſſity; of which a good ſpecimen has already (pages cvi. cvii.) been quoted from the writing of DR PRIESTLY.

Suppoſing then, that, without *reading* my Eſſay, he had juſt dipped into it, or that, directed by the table of contents at the beginning, he had read the 9th, 10th, 12th, 15th, or 21ſt ſection of it, or any other the title of which might peculiarly excite

excite his curioſity, and that he diſcovered the nature of the reaſoning and illuſtration employed in it, and perceived that neither arbitrary hypotheſes, nor appeals to conſciouſneſs, nor ambiguous words, could be employed to any advantage in anſwer to it, and that he did not immediately nor clearly perceive any ſatisfactory refutation of it; what could reaſonably be expected of him? What could he do but juſt what he has done? —namely, expreſs his confidence in his own opinion, and his contempt for every thing that could be urged againſt it, and, on one pretence or another, refuſe to enter again on the argument.

With reſpect to his two friends, whom he thought good judges of the ſubject of my book, and to whom it ſhould ſeem he had given it to read, chooſing to read and judge of it by proxy, rather than in perſon, and who have ſo pragmatically expreſſed their confidence in the weakneſs of my argument; their conduct requires ſome animadverſion.

Suppoſing them to have read and to have underſtood my Eſſay, they muſt have known, both from the tenor of it, and alſo from DR PRIESTLY's information, for what purpoſe, and in what a fair and honourable manner, I had ſubmitted it to his reviſion; and if they had really diſcovered any error or imperfection in my argument, it muſt have been eaſy for them to point it out in ſuch a manner as to preclude all poſſibility of diſpute or cavil about it; and it would have been reaſonable, and candid, and liberal, in them to have done ſo. Not to do ſo, when they thought it was in their power, was unreaſonable, uncandid, and illiberal, in the higheſt degree.

But their conduct in this reſpect, however reprehenſible, cannot appear ſurpriſing to any perſon who conſiders what manner of men they *muſt* have been; for it is certain, that we do not gather grapes of thorns, nor figs of thiſtles; and that men, as well as trees, may be known by their fruits. Though I know no more of theſe nameleſs philoſophers than juſt what DR PRIESTLY has mentioned in his letter

to

to me, yet, even from that little information, I could judge with confidence, that nothing better was to be expected of them.

They are two of his friends, in his opinion good judges of the ſubject: this implies that they had adopted and profeſſed to believe his doctrine. It is plain, that he could never regard men as good judges of the ſubject who differed in opinion from him concerning it, and who reckoned his doctrine not merely erroneous, but abſurd and incredible. I am well convinced, that he would not even have thought his friend DR PRICE a good judge of it; for that would be to admit that he himſelf was not one. But this is not all: DR PRIESTLY has made the admiſſion of the doctrine of Neceſſity a kind of teſt of a perſon's having a real philoſophical genius, and has declared, that the oppoſite opinion is a glaring abſurdity.

Now, theſe things being ſo, the conduct of the two nameleſs philoſophers, ſuppoſing

ſuppoſing them not to have diſcovered any error or imperfection in my argument, muſt appear very natural: for to have acted otherwiſe, and to have acknowledged that my reaſoning was, or at leaſt appeared to them, juſt and concluſive, would have been, in the firſt place, to forfeit the eſteem, and incur the contempt and reproach, of DR PRIESTLY; in the ſecond place, to acknowledge that they had all been maintaining with arrogance a doctrine which was abſurd; and, in the third place, to confeſs that they were fairly convicted of having aſſerted a doctrine which they did not believe. This was ſcarce to be expected of any two men; and certainly not of two Metaphyſicians, accuſtomed to vague reaſoning, and endleſs wrangling, and appeals to conſciouſneſs, on all occaſions; ignorant that open unequivocal experiment is of higher authority than any hypotheſis or ſyſtem, and that ſtrict mathematical reaſoning is, in ſome caſes, a teſt of the veracity, and even of the moſt ſecret thoughts of men; and who perhaps, after all, underſtood no more of the argument on which they preſumed

ſumed to decide ſo arrogantly, and were no more qualified to judge of it than the *fœtus in utero.*

If the two nameleſs philoſophers, the friends of Dr Priestly, or he himſelf, conceive that I do them any injuſtice in theſe remarks, they muſt know, that there is one, and but one, way for them to vindicate themſelves. Let the two philoſophers fairly ſtate their objections to my argument, and ſhew to others that weakneſs of it which they ſo confidently ſaid they had perceived; let them point out, if they can, the error of my deduction, by neceſſary conſequences from that principle which I undertake to diſprove; let them prevail on their friend Dr Priestly, if they can, to peruſe their anſwers to my argument; which it would ſurely be very uncivil and unkind in him to refuſe to two ſuch friends, of whoſe judgement he had ſo good an opinion; let them prevail on him to give his *imprimatur* to their anſwers, by declaring that he thinks them valid and concluſive, which he cannot refuſe to do without

ſhewing

ſhewing that he thinks them nonſenſe; and, laſtly, let them allow me to peruſe them, if not before they are printed, at leaſt before they are publiſhed, as I have done to them with reſpect to my Eſſay; and I engage to peruſe them with attention, and either to acknowledge the validity of them, or to point out preciſely the errors of them, and to allow ſuch acknowledgement, or ſuch reply of mine, to be printed and publiſhed along with their anſwers; ſo that every intelligent reader may judge which of us fails, either in point of candour or of good reaſoning; for a moſt grievous defect in one or both of theſe things there *muſt* be, either on one ſide or the other.

I think it right to make the ſame offer to MR COOPER; whom, from the *identity* of the name, and ſome other circumſtances, I judge to be the *ſame* perſon who has lately favoured the world with a volume of Eſſays, Ethical, Theological, and Political. If I am right in this conjecture, I mean, according to the vulgar notion of perſonal identity, which I underſtand MR

COOPER

Cooper has *diſcovered* to be erroneous, he muſt be very peculiarly pledged indeed to ſtate his objections to my argument. For he had ſeen and peruſed my Eſſay before his volume was publiſhed; and, as I underſtand from the Reviews, for I have not yet ſeen his work, he has in it maintained the doctrine of Neceſſity as confidently as any of his great predeceſſors had done.

I ſhould gladly hope, therefore, that I was miſtaken in the opinion which I expreſſed in my letter to Dr Priestly with reſpect to Mr Cooper's reaſons for not favouring me with his remarks on my Eſſay, as at one time he intended, and repeatedly promiſed to do. I hope he has really thought he perceived ſome error in my reaſoning, and that he will yet take the trouble to point it out to me. I will with much pleaſure pay the utmoſt attention to any of his objections *that relate preciſely to my peculiar plan and mode of reaſoning*: and this not merely in conſideration of his great merit as a Metaphyſician, and his *diſcoveries* in metaphyſics, for

which kind of diſcoveries he ſeems to have an admirable genius, but in hopes that he may be a little more in the ſecret with reſpect to the nature and force of mathematical reaſoning than the two Birmingham philoſophers ſeem to be.

I think it may be right even to remind him of the following paſſage in his laſt letter to me, dated, Lever Hall, near Bolton, Lancaſh. Sunday, June 6. 1790.

" I ſhall again ſit down to your work, " and hope to finiſh within no long time " the obſervations I had to make on it. You " may depend upon receiving them ſo " ſoon as they are finiſhed; and they ſhall " then be at your option to diſpoſe of as " you pleaſe. You mention, that *before* " *winter* you mean to publiſh your Eſ- " ſays: if ſo, I think I may very well " promiſe to let you have what I have to " ſay upon the ſubject in full time for " your purpoſe. Should any further ac- " cident, however, prevent my proceed- " ing as I intend, you ſhall certainly know " in time; becauſe I ſhould be extremely " ſorry

" ſorry to delay a work which I think the
" public, as well as myſelf, will be very
" glad to ſee abroad in the world."

MR COOPER, I preſume, will remember what I mentioned to him very fully, two years ago, concerning *any other* objections that might be made to my argument. Nothing can be eaſier than to make any number of objections to it by means of ambiguous words, and vague analogical reaſoning; but all that can be ſaid or done in this way is but like ſounding braſs or a tinkling cymbal; and all ſuch objections, far from tending to ſhake my argument, are to be regarded as acknowledgements, ungracious enough, it muſt be confeſſed, that thoſe who make them have no valid objections againſt it to offer.

Theſe ſtrong charges of *mala fides* in thoſe philoſophers who have moſt confidently aſſerted their belief of the doctrine of Neceſſity, are fully implied in the general tenor of my Eſſay; and have not eſcaped the obſervation of thoſe who at my

requeſt have peruſed it; ſome of whom have expreſſed to me with freedom and candour their diſapprobation of them. Their opinion on this point, after due conſideration, I have diſregarded; becauſe I think it wrong: but it is proper to ſtate the objections to ſuch charges as I have advanced, and my own reaſons for not thinking them valid; which may be done very conciſely.

The objections I ſhall give in the very words of one for whoſe judgement I have the higheſt reſpect; and who, of all that have diſapproved of my conduct in advancing ſuch charges, is the only one who has given me his reaſons for that diſapprobation.

" I think one can hardly be too cautious of denying the *bona fides* of an antagoniſt in a philoſophical diſpute. It is ſo bitter a pill, that it cannot be ſwallowed without being very well gilded and aromatiſed. I cannot but agree with you, that aſſent or belief is not a voluntary act. Neither is ſeeing when the eyes are open.

One

One may voluntarily ſhut his bodily eyes, and perhaps the eye of his underſtanding. I confeſs this is *mala fides*. But as light may be ſo offenſive, that the bodily eye is ſhut involuntarily; may not ſomething ſimilar happen to the eye of the underſtanding, when brought to a light too offenſive to ſome favourite prejudice or paſſion to be endured?——

The want of ſincerity, or *bona fides*, in a large body of men reſpected and reſpectable, is a very tender place, and cannot be touched with too much delicacy, tho' you were ſure of being able to demonſtrate it. I am afraid it may be taken as an inſult, which even demonſtration cannot juſtify. Your not making the concluſion general, for want of a ſufficiently extenſive information, will not ſatisfy; becauſe it ſeems to extend the concluſion as far as your obſervation has extended, and becauſe the reaſons on which you ground your concluſion ſeem to extend it to all Fataliſts that can draw a concluſion from premiſes.

If DAVID HUME, or any other perſon, has charged thoſe who profeſs to believe men to be free agents, with inſincerity, I think they did wrong; and that I ſhould do wrong in following their example.

But ſetting apart the conſideration of *Bienſeance*, I doubt of the truth of your concluſion. If human reaſon were perfect, I think you would be better founded. But we are ſuch imperfect creatures, that I fear we are not exempted from the poſſibility of ſwallowing contradictions. Could you not prove with equal ſtrength, that all bad men are infidels? yet I believe this not to be true.

I truly think, that a Fataliſt, who acted agreeably to his belief, would ſit ſtill, like a paſſenger in a ſhip, and ſuffer himſelf to be carried on by the tide of Fate; and that, when he deliberates, reſolves, promiſes, or chooſes, he acts inconſiſtently with his belief. But ſuch inconſiſtencies, I fear, are to be found in life; and if men be ever convinced of them, it muſt be by ſoothing words and ſoft arguments, which

ludunt

ludunt circum præcordia. For the force of prejudice, joined with that of provocation, will ſhut the door againſt all conviction.

I humbly think, therefore, that it will be proper and becoming to expreſs leſs confidence in your mathematical reaſonings, though I really believe them to be juſt on the hypotheſis you combat. Fataliſts will think, that when you put the iſſue of the controverſy ſolely upon the experiments, you treat them like children. No Fataliſt will contend with you upon that footing, nor take it well to be challenged to do ſo."——

I reſpect very highly, as I think every perſon who reads them muſt do, the candour, and gentleneſs, and moderation, which appear in theſe remarks: and I acknowledge that they are acute and ingenious, and that they ſhew profound knowledge of human nature: but I can by no means acquieſce in them, as either ſtrictly juſt and concluſive, or even as fairly applicable to my conduct, and my mode

of

of reaſoning, in advancing, and endeavouring to prove, ſuch ſevere charges as are now the ſubject of conſideration.

Firſt, with reſpect to the imperfection of the human faculties, which appears to me to be the chief argument in the preceding remarks, I acknowledge, that we are indeed imperfect creatures in every reſpect; and in particular that our reaſon is imperfect. But I can by no means admit, nor do I believe that it has ever yet been maintained by any philoſopher, that abſolute perfection of human reaſon is requiſite to enable us to perceive and underſtand neceſſary conſequences, when they are clearly pointed out to us; or, in other words, to underſtand and acquieſce in logical and mathematical demonſtration. The general and well known fact is altogether adverſe to ſuch an opinion: for numberleſs individuals, whoſe faculties are manifeſtly imperfect, eaſily underſtand, and invariably and irreſiſtibly acquieſce in, ſuch demonſtrations. The imperfection of human reaſon fully accounts for our not perceiving intuitively *all* the neceſſary conſequences

ſequences of an aſſumed principle, and for the difficulty which moſt of us find in following a long and complicated train of neceſſary conſequences, ſuch as we meet with in many mathematical demonſtrations: but I do not ſee how it ſhould ever make us admit or ſwallow contradictions; nor do I believe that ſuch is the fact; and I know that the directly contrary opinion hath always been admitted as an axiom of logic; which axiom is the very foundation of all arguments *ad abſurdum*. Theſe have always been held juſt as valid as any other kind of demonſtrations; and have been ſo much uſed by Geometers, that it has been eſtimated that one half of their demonſtrations are of that kind. No one ſurely will maintain, that, on this account, they are to be rejected, or even diſtruſted; or that men, in conſequence of any ſuppoſed imperfection in their reaſon, can both believe thoſe propoſitions, and the contraries of them, at the ſame time: for they might have believed the contraries of them till they knew better; this being implied, as I think, in the notion of imperfect reaſon.

The inſtance given as parallel to the ſwallowing of contradictions, namely, the caſe of a perſon who believes the truths of revealed religion, and yet acts immorally, is ingeniouſly ſelected, and well ſtated, by the author of the remarks; but it is not by any means a ſtrictly parallel caſe. There is no doubt *ſome reſemblance*; but the *difference* between them is *infinite*, and plainly conſiſts in this, that a perſon's moral conduct is voluntary, and depends on himſelf; but his belief (as the author of the remarks acknowledges) is involuntary, and is determined, not by himſelf, but by the evidence which is before him. A man may ſay, *Video meliora, proboque; deteriora ſequor*, without being chargeable either with abſurdity or falſehood: it may even appear beyond all doubt, from the general tenor of his life and converſation, that he ſpeaks truth; and in this caſe he will be a fit object of diſapprobation, of contempt, of deteſtation, and of puniſhment; which otherwiſe he could not be. On the ſame principle, a perſon may be a bad man, without being an infidel; he may believe and tremble, while he acts according to his

his own paſſions and his own intereſt, in violation of the precepts of religion, as well as of morality and of human laws. But there is no principle in human nature by which a perſon can ſay with truth, I ſee and acknowledge what is true, but I believe the contrary of it. Such an aſſertion would juſtly be reckoned an abſurdity; ſomething not merely falſe, but impoſſible and incredible, as being repugnant to an univerſal law of human thought.

Secondly, with reſpect to its being wrong to charge men with inſincerity in their profeſſions of opinion and belief on ſuch points as I have had occaſion to conſider, I acknowledge, that it is very wrong to do ſo *unjuſtly*; and very fooliſh to do ſo, unleſs the charge can be fully eſtabliſhed by clear and deciſive evidence: but when this can be done, as I am confident it may be on the ſubject in queſtion, I ſee no wrong in it; on the contrary, I think it perfectly right to detect, and to expoſe to juſt contempt and reproach, all thoſe who have acted in ſuch a manner. But as

my opinion and my conduct on this point muſt be fully underſtood, both from what has been already ſaid, and from the general tenor of my Eſſay, I need not enter on any further diſcuſſion of it in this place.

Thirdly, with reſpect to the propriety of endeavouring to gild the bitter pill, that thoſe concerned may ſwallow it with the leſs reluctance; I have made no ſuch attempt, becauſe I thought it altogether hopeleſs. The nature of the pill to be ſwallowed could not by any means be concealed; and I was ſure that none of my *patients* would even endeavour to ſwallow it. To ſpeak without metaphor, the proof of the charge of *mala fides* reſults ſo plainly from my mode of reaſoning, that no perſon who has maintained the doctrine of Neceſſity as his ſerious belief can ever acquieſce in my argument, without acknowledging his own *mala fides* in his former aſſertions; which no perſon will do.

Their ſituation in this reſpect I conceive to be very ſimilar to that of a certain Biſhop,

ſhop, on another point. This learned Prelate, it is ſaid, fell into a very awkward miſtake, the firſt time he met with aſparagus at table; and not knowing how they were to be eaten, began to eat them at the wrong end. One of the company, obſerving what he was doing, and gueſſing the reaſon of it, endeavoured to ſet him right, by telling him how he ought to eat them. But he, diſpleaſed at being found ſo ridiculouſly miſtaken, and too proud to be ſet right, declared, that he always eat them that way, and that it was the beſt way of eating them; and in this profeſſion, which indeed it was not eaſy to retract, and in the correſponding practice in eating aſparagus, it is ſaid he perſiſted all the days of his life.

Many a tough and taſteleſs morſel the unlucky Biſhop muſt have chewed; but ſtill he eſcaped the mortification of being obliged to ſwallow the bitter pill of acknowledging his own *mala fides* in his firſt declaration. He even avoided that concluſive evidence of his inſincerity, which inconſiſtency of his actions and his profeſ-

ſions

ſions would have afforded: he had the comfort of eating his aſparagus in a manner perfectly conſiſtent with that very peculiar ſyſtem concerning them which he profeſſed to believe.

In this reſpect I think he had greatly the advantage of the aſſertors of the doctrine of Neceſſity; none of whom have ever acted conſiſtently with their own ſyſtem, nor, I am confident, ever *will* act according to it, in *trying caſes*; that is, in caſes where the reſult of the motives applied *muſt* be different in point of action, according to their doctrine, from what it probably *would* be, according to the notion of liberty, or ſelf-governing power in mankind. The only queſtion that remains with me on this point, and which I was very deſirous to determine by fair experiment, (the only way in which it can be determined), is, Whether any of them can *even attempt* to reconcile their actions with their profeſſions of belief, which is, in other words, to refute my ſuppoſed demonſtration, without affording additional evidence of their own *mala fides*. This, for

for example, I think every perſon would do who ſhould deny the truth of any ſelf-evident axiom, or the juſtneſs of a regular ſyllogiſm, or the fairneſs and concluſiveneſs of open unequivocal experiment.—— The author of the remarks himſelf ſeems perfectly aware of what I have found experimentally true, that they will not put the iſſue of the controverſy to the teſt of experiment, and that they are diſpleaſed when I propoſe that teſt to them: but how he reconciles this conduct with the ſuppoſition of *bona fides* on their part, I can by no means conceive.

As to the praiſe of *circum præcordia ludit*, ſo juſtly and emphatically given by PERSIUS to HORACE, I acknowledge it to be a very great, and in many caſes a very deſirable one. If I were compoſing a ſong for a Comic Opera, a taſk for which I am ſingularly ill qualified, I ſhould be very anxious to acquire that praiſe. But I think, in ſtrict ſcientific reaſonings, it *may* be diſpenſed with, as not being eſſential to them. And in an attempt to detect pretences and impoſture, it *muſt* be diſpenſed with, becauſe

cauſe it cannot be attained. In this part of my undertaking, therefore, I ſhall be perfectly contented with the praiſe, or cenſure as ſome may think it, which is given to JUVENAL, *Ardet, inſtat apertè, jugulat.*

Laſtly, with reſpect to my not making my unfavourable concluſion general, only for want of ſufficiently extenſive information, and ſeeming to extend it as far as my obſervation has extended, I can ſee no wrong in either of theſe particulars. It is a matter of fact, which I cannot alter, and will not falſify, and ſhould in vain attempt to conceal, that *not one* of thoſe who were accuſtomed to aſſert the doctrine of Neceſſity, and who have conſidered my argument, have either admitted my (ſuppoſed) neceſſary inferences from their own principle, or ſhewn me any error in the reaſoning by which they were deduced from it. It is in all caſes unreaſonable, and in this it would be uncandid alſo, to draw a general concluſion from particular premiſes. I therefore limit my concluſion according to the ſtricteſt rules of logic. I do

do not mean at any time to extend it to *all* men who can draw a concluſion from premiſes, but to thoſe only who can do ſo, and yet deny my concluſion, without ſhewing any error in my reaſoning. My unfavourable concluſion never *can* affect thoſe who do either the one or the other of theſe things. As I think it inconſiſtent with any competent knowledge of human nature, to admit my inferences from the doctrine of Neceſſity; as things either true, or probable, and fit to be tried experimentally, I preſume, with confidence, that no aſſertor of that doctrine will admit them; and conſequently that nothing is left for them, if they would maintain their character both in point of reaſon and of ſincerity, but to ſhew that there is ſome error in my reaſoning. To aſcertain whether the defect in any of them who fail to do ſo be the want of underſtanding, or only the want of ſincerity, I have provided a very plain and eaſy teſt. I employ the very *ſame mode of reaſoning*, founded on the very *ſame principles*, to deduce ſimilar inferences with reſpect to lifeleſs bodies, ſuch as a billiard-ball or a balance. If

they do not underſtand my reaſonings, and admit my concluſions, with reſpect to ſuch bodies, which reaſonings and concluſions ordinary men eaſily underſtand, and uniformly admit, their defect *may* be only want of underſtanding; but if they do underſtand and admit them with reſpect to bodies, and refuſe their aſſent to them with reſpect to the actions of men, without ſhewing ſome error in the reaſoning in the one caſe which there was not in the other, their defect *muſt* be want of ſincerity.

Proceeding, as I have uniformly done, on this plan, and with all theſe precautions, I have the ſatisfaction to think, that it is impoſſible I ſhould do the ſmalleſt *injuſtice* to any individual, or to any ſet of men. Nor can any perſon decently, or without a kind of abſurdity, take offence at my concluſions; for they cannot in any degree affect him, unleſs they be juſt: and if they be ſo, thoſe whom they do affect cannot reaſonably complain of them. Thoſe who have ſeriouſly believed the doctrine of Neceſſity, if there be any ſuch, cannot

cannot be diſpleaſed at ſeeing it brought to a fair and deciſive teſt: thoſe who have been only confounded and embarraſſed with it, but who never aſſerted it, and who could neither diſprove nor believe it, which I am convinced has been the caſe with many perſons, muſt be glad to ſee it brought to ſuch a teſt: And as for thoſe who have boldly aſſerted it without believing it, if there be any ſuch, though they may not like to be told, it is very fit they ſhould know, that it is poſſible, in ſome caſes, to aſcertain the moſt ſecret thoughts of men, in ſpite of their own boldeſt aſſertions and denials; and conſequently that in ſuch caſes there are means of detecting pretences, as well as of diſcovering errors in ſcience.

EDINBURGH,
Jan. 20. 1792.

ESSAY.

ESSAY

ON,

THE DIFFERENCE

BETWEEN

THE RELATION OF MOTIVE AND ACTION,

AND

THAT OF CAUSE AND EFFECT,

IN PHYSICS:

ON

PHYSICAL AND MATHEMATICAL PRINCIPLES.

INSANUM QUIDDAM ESSET, ET IN SE CONTRARIUM, EXISTIMARE EA QUÆ ADHUC NUNQUAM FACTA SUNT FIERI POSSE, NISI PER MODOS NUNQUAM ADHUC TENTATOS.

BACON.

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AMONG all the various relations that have engaged the attention either of philoſophers or of mankind in general, there is none which has commonly been thought to bear a cloſer and more ſtriking reſemblance and affinity to that of

A cauſe

cauſe and effect in phyſics, than the familiar and well-known relation between the ordinary voluntary determinations and actions of men, and the motives or principles of action to which they are referred, and from which they are conceived in ſome meaſure to proceed: yet there are none which the vulgar diſtinguiſh more readily and uniformly, in point of thought at leaſt, however they may expreſs them in words; nor any which philoſophers have more induſtriouſly or more ſucceſsfully laboured to confound.

The popular perſuaſion of what is called the Liberty of human actions implies a conviction, that there is an important and well-underſtood difference between thoſe two relations.

The philoſophical doctrine of Neceſſity implies and conſiſts in the perſuaſion, that the two relations in queſtion are either preciſely or very nearly the ſame.

The former by no means conſiſts in the belief, that there is no relation between motives

motives and the determinations and actions of men, which is the notion of it that many philoſophers have unluckily adopted, and imputed to the vulgar, and employed much labour and ingenuity in refuting; but in the belief that there is in man, beſides the motives of his voluntary determinations and actions, another principle of change and activity, a certain independent, ſelf-governing, ſelf-determining power, which he may at his own diſcretion exert, by acting either according to motives, or in oppoſition to motives, or without any motives at all: while, on the contrary, it is conceived that there is no ſuch power in inanimate bodies; and that every change occurring in ſuch bodies is purely an effect of ſome cauſe, in conſequence of which it comes to paſs, perhaps neceſſarily, and at leaſt certainly and inevitably, bodies being equally unable to produce any change in themſelves, or to prevent any change in themſelves, correſponding to a cauſe applied.

The latter doctrine implies, that whatever other differences there may be be-

tween the relation of motive and action, and that of phyſical cauſe and effect, there is at leaſt no ſuch independent principle of change and activity, or ſelf-governing power, in living perſons, any more than in lifeleſs bodies; and that all our determinations and actions come to paſs in conſequence of the motives applied, as purely, as certainly, as irreſiſtibly on the part of the perſon, as phyſical effects in conſequence of the application of their reſpective cauſes.

That there is an evident and well-known relation between the actions of men and their appetites, paſſions, deſires, averſions, judgements of right and wrong, expedient and inexpedient, and in general whatever are regarded as motives or principles of action, I believe never was nor ever can be doubted or denied by any man of ſenſe and candour.

It would ſurely be needleſs and ridiculous to ſet about proving, that there is a moſt evident and intimate relation between hunger and eating, between thirſt and

and drinking, between fear and daſtardly conduct in the hour of danger, between benevolence and good offices, between anger, or malice, or rapacity, and unjuſt, unkind, and cruel behaviour. It would even be unneceſſary to mention a truth ſo obvious and generally acknowledged, were there not reaſon to think, that ſome authors, who had eſpouſed the popular ſide of the queſtion concerning Liberty and Neceſſity, had gone ſo far, in the heat of controverſy, as to deny that there was any particular relation between motives and actions. This may be inferred from the manner in which ſome of the ableſt advocates for the doctrine of Neceſſity, and particularly Mr HUME, have ſtated their arguments. Mr HUME's reaſonings proceed chiefly on the ſuppoſition, that thoſe who held the oppoſite opinion to his, denied that there was any ſuch relation between motives and actions as might enable us to reaſon from the one to the other. The ſame miſapprehenſion of the popular perſuaſion of Liberty is apparent in the writings of Dr PRIESTLY, vol. 2. p. 87. & 88. in the account of the character of his ſuppoſed

ſed ſon B, to whom he attributes what he calls Philoſophical Liberty. No authors, indeed, have come to my knowledge, who maintained expreſsly ſuch an opinion; but as it ſeems to have been imputed to ſome, particularly to DR KING by LEIBNITZ, it is proper to diſclaim it in the moſt explicit terms, as being not merely erroneous, but extravagant, and as repugnant to popular belief, or common ſenſe, as the philoſophical doctrine of Neceſſity.

It may even be thought a very fooliſh, or at beſt a needleſs attempt, to ſet about explaining to men in any degree the nature of the relation between motive and action; as it is ſcarce credible that any thing ſhould be more generally or more accurately underſtood by them, than what is an object of direct conſciouſneſs, of hourly experience, and of ſuch high importance, as to command their conſtant attention.

Nevertheleſs, as many philoſophers have been of a contrary opinion, and not content with endeavouring to explain what needed

needed no explanation, and could admit of none, have maintained, that the relation in queſtion is very different from what mankind have generally conceived it to be; and, in particular, that it is eſſentially the ſame with that of cauſe and effect in phyſics; it will not, I hope, be thought ſo abſurd as at firſt ſight it might appear, to endeavour to inveſtigate, in a more accurate manner than has hitherto been attempted, that ſeemingly obvious point; and to aſcertain, by a kind of evidence which has hitherto been ſuppoſed free either from fallacy or from diſpute, if not the full extent, and all the particulars, at leaſt the reality, and ſome of the moſt important and intereſting circumſtances of that difference which the vulgar have ſo generally acknowledged, and which ſo many philoſophers have been fond of denying.

In the firſt place, it is obvious, not only that there is a very intimate relation between the motives and actions of men, but likewiſe that this relation bears a ſtrong reſemblance or affinity to that of

cauſe and effect in phyſics, as well as to that of agent and action. Even the language which we commonly employ in ſpeaking of the relation of motive and action, is in a great meaſure formed on theſe analogies.

We often inquire and ſpeak about the cauſes of the actions of men, meaning the motives of them, juſt as we do about the cauſes of any occurrences in the material world. We ſpeak currently of actions proceeding from, or produced by certain motives or cauſes; we ſpeak of the influence, the power, the irreſiſtible force of motives, juſt as freely as we do of expanſion, fluidity, and evaporation, as proceeding from or produced by heat; or as we do of the influence or the actions of men on the objects around them, or of the influence of the ſun and moon on the tides, of the power of medicines, or of the irreſiſtible force of ſteam or of gunpowder.

Theſe modes of expreſſion, which are by no means peculiar to any one language, nor

nor confined to a few languages, but ſeem to be common in all, and to have been ſo in all ages and nations, and which may be employed in long diſcourſes and chains of reaſoning, without producing any obſcurity or embarraſſment, ſhew plainly how cloſe and ſtriking the analogy is, in many obvious circumſtances at leaſt, among the different relations in queſtion.

And as a proof that the analogy ſo generally acknowledged is not viſionary, but very real, any man of good ſenſe, enlightened by a little experience, may undertake with confidence, from knowing what people's motives are, to foretell what their actions will be; or, from knowing their actions, to infer what their motives have been: juſt as in phyſics, with the ſame kind of aid from experience, we can foretell an effect from knowing the cauſe; or infer the cauſe from knowing the effect.

Yet it cannot juſtly be ſaid, that *Cauſe* is the *generic*, *Motive* the *ſpecific* term; and that the latter is employed only in a more

limited ſenſe than the former, being applied excluſively to denote thoſe particular cauſes which, by influencing * the will, indirectly produce the actions of men; for mankind in general ſhow plainly, that they conceive ſome further difference between the two relations in queſtion, than merely that of *Genus* and *Species*; and that they even believe there is ſomething in the ſuppoſed genus which is not in the ſuppoſed ſpecies; particularly the conſtant, and, with reſpect to us at leaſt, inſeparable connection between cauſe and effect; while the connection between motive and action is conceived to be only occaſional and ſeparable, and, in all ordinary caſes, in a great meaſure dependent on ourſelves.

* Theſe and ſuch like phraſes I uſe in compliance with cuſtom, *quem penes &c.* and becauſe it is difficult to avoid them, and would look like affectation to attempt to avoid them. But I am aware of the impropriety and incongruity of them, as miſrepreſenting the nature of the will, and confounding the three different notions and relations of Agent, Cauſe, and Motive.

That

That ſuch has always been the perſuaſion, whether right or wrong, of the bulk of mankind, whatever words or phraſes they may have employed in ſpeaking of both or either of thoſe relations, is not in general diſputed even by thoſe who maintain that there is no ſuch difference between them. Nor can it reaſonably be diſputed, though, to be ſure, Mr HUME has made a very ingenious and elaborate attempt to that purpoſe; as the aſtoniſhment and indignation of the bulk of mankind at the doctrine of Neceſſity, when they firſt hear it, and their incredulity with reſpect to it even when it ſeems moſt unanſwerably proved, plainly ſhew what is their general and natural perſuaſion.

It is evident, that if mankind had conceived, as ſome of their expreſſions ſeem to imply, that their motives were the cauſes of their volitions and actions, in the ſame ſenſe of the word *Cauſe* that it has in phyſics; as, for inſtance, when we ſay that heat is the cauſe of fuſion, impulſe the cauſe of motion, the ſun and moon the cauſes of the tides; then the doctrine

of Neceſſity would have been the common and popular perſuaſion. It would, no doubt, have been a falſe one, and might have been confuted by philoſophers; but no other *could* have prevailed among men unacquainted with good reaſoning, not aware of the importance of accurate obſervation and nice diſcrimination in all matters of ſcience, and ignorant and even unſuſpicious of any difference between the relation of motive and action and that of cauſe and effect in phyſics. They might juſt as well have ſuppoſed, that the relation between impulſe and motion in a billiard-ball was conſtant, and that between heat and the melting of ſnow only occaſional, and dependent on the good-will and pleaſure of the ſnow.

It may even be worth while to remark, in illuſtration of this point, that mankind have never regarded belief as a voluntary act of the mind, or as one dependent on the choice, power, or diſcretion of the perſon believing. Various circumſtances of affection or paſſion, or even, for example, the having laid a bet on any unknown or doubtful

doubtful point, may make it highly agreeable to believe or diſbelieve, contrary to the proper evidence of ſuch a point. But we feel it to be impoſſible to do ſo. With the ſtrongeſt inclination to deceive ourſelves, we are conſcious that we cannot do it, if we but attend to the evidence. Now, the relation between evidence or proof of various kinds, and that act or ſtate of the mind which is called belief, is plainly very different from that of motive and action, and from that of cauſe and effect in phyſics; yet it bears a great reſemblance to both; between which there is a ſtill greater difference than between either of them and the relation of evidence, by which all belief is regulated, independently of the choice or determination of the perſon believing.

It is true, that mankind in general have ever found it difficult, perhaps I ſhould ſay impoſſible, to point out, in a ſatisfactory manner, any circumſtance of diſtinction between the relation of phyſical cauſe and that of motive, though they have always conſidered them as ſomehow dif-

ferent, and cannot be brought to think them the ſame.

The obvious circumſtance of diſtinction or ſuppoſed difference between them, which every perſon is ready to point out at once, when he firſt hears of the queſtion, to wit, that in the relation of motive and action, the perſon has the power of acting or not acting as he pleaſes or chooſes, or according to the determinations of his will; whereas, in the relation of cauſe and effect, the body has no ſuch will, power, choice, or liberty, but inevitably undergoes the change correſponding to the cauſe applied, is by no means ſatisfactory to thoſe philoſophers who have thought fit to erect themſelves into a tribunal of higher authority than the voice of nature, or the common ſenſe of mankind. Nay, though for my own part I regard the general and irreſiſtible conviction of mankind, with reſpect to ſuch a difference, as ſatisfactory and deciſive evidence as to the general point at iſſue; yet I think it muſt in candour be owned, that it is by no means a ſufficient anſwer to the arguments of thoſe philoſophers

phers who hold a different opinion, founded on the ſtriking reſemblance or analogy between the two relations in queſtion. And theſe arguments, which appear ſo plauſible, and have been ſo confidently maintained, I think can be anſwered completely, and in a manner ſtrictly philoſophical, only by ſhewing, that the two relations in queſtion are not preciſely the ſame, by pointing out ſome or all of the differences between them, and by proving that theſe differences are ſuch as *neceſſarily* imply the preſence and very frequent exertion of a ſelf-governing or ſelf-determining power, ſuch as the vulgar have ſuppoſed, in living perſons, and not in inanimate bodies. For no philoſophers aſſert, that, in conſequence of the influence of motives, men are, in ordinary caſes, conſtrained or compelled to act againſt their will, but only that their will itſelf is influenced by the motives applied; or, in other words, that, according to the philoſophical hypotheſis of the ſameneſs of the relation of cauſe and that of motive, every volition or voluntary determination of a perſon is truly an effect of the motive, or com-

combination of motives, to which it is referred, as much as motion in a billiard-ball is the effect of impulſe, and in the ſame ſenſe of the term *effect* in which it is uſed in phyſics, in ſpeaking of the changes which occur in inanimate matter, and of the relation of theſe changes to what are called the cauſes of them.

In conſequence of this view of the queſtion, ſeveral philoſophers, as for inſtance Mr HUME and Dr PRIESTLY, have ventured to aſſert, that all mankind have ever been, in their thoughts and in their actions, as much convinced of the doctrine of neceſſity as philoſophers are, and only differ from them in the mode of expreſſing their thoughts. Indeed Dr PRIESTLY has gone a great deal further, having aſſerted repeatedly, That "there is no abſurdity "more glaring to his underſtanding, "than the notion of philoſophical li-"berty."

Suppoſing Mr HUME's to be a fair and full account of the difference between the vulgar and the aſſertors of the doctrine of Neceſſity,

Neceſſity, (which however it evidently is not), it would be reaſonable to aſk, How it comes to paſs that a diſtinct and accurate expreſſion of what they always thought ſhould to the bulk of mankind appear to denote, not merely ſomething different from what they uſed to think, but ſomething new, and falſe at leaſt, if not incredible and abſurd.

For my own part, after the ſtricteſt attention that I have been able to pay to the ſubject, both by careful reflection on my own thoughts, and by examining other men with reſpect to theirs, I am perfectly convinced, that the doctrine of Neceſſity, even as explained and aſſerted by Mr HUME, in what he calls his *Reconciling Project*, is altogether repugnant, not merely in words, but in thought and principle, to the natural ſuggeſtions of the human faculties, and to the general, and, if I miſtake not, the irreſiſtible conviction of mankind.

Indeed Mr HUME himſelf, notwithſtanding the aſſertion which I have been

conſidering, ſeems to have been ſenſible that there was ſome difference, in thought as well as in words, between the aſſertors of the doctrine of Neceſſity and the vulgar, with reſpect to the relation of Motive and Action. He pays no regard to the vulgar perſuaſion, as a principle in philoſophy, or as having any weight in deciding the point in queſtion; but he plainly admits it as a *phænomenon*, or matter of fact, and even acknowledges it to be a curious one, by offering an elaborate explanation of it on his own principles.

" I have frequently conſidered (ſays he) " what could poſſibly be the reaſon why " all mankind, though they have ever, " without heſitation, acknowledged the " doctrine of Neceſſity, in their whole " practice and reaſoning, have yet diſco- " vered ſuch a reluctance to acknowledge " it in words, and have rather ſhewn a " propenſity to profeſs the contrary opi- " nion. The matter, I think, may be ac- " counted for after the following manner: " If we examine the operations of body, " and the production of effects from their " cauſes,

" cauſes, we ſhall find that all our facul-
" ties can never carry us farther in our
" knowledge of this relation, than barely
" to obſerve, that particular objects are
" *conſtantly conjoined* together, and that the
" mind is carried, by a *cuſtomary tranſi-*
" *tion*, from the appearance of one to the
" belief of the other. But though this
" concluſion concerning human igno-
" rance be the reſult of the ſtricteſt ſcru-
" tiny of the ſubject, men ſtill entertain
" a ſtrong propenſity to believe, that they
" penetrate farther into the powers of Na-
" ture, and perceive ſomething like a ne-
" ceſſary connection between the cauſe
" and the effect. When, again, they turn
" their reflections towards the operations
" of their own minds, and *feel* no ſuch con-
" nection of the Motive and the Action;
" they are thence apt to ſuppoſe, that there
" is a difference between the effects which
" reſult from material force, and thoſe
" which ariſe from thought and intelli-
" gence. But being once convinced, that
" we know nothing farther of cauſation
" of any kind, than merely the *conſtant*
" *conjunction* of objects, and the conſe-

" quent *inference* of the mind from one to
" another, and finding that theſe two cir-
" cumſtances are univerſally allowed to
" have place in voluntary actions, we may
" be more eaſily led to own the ſame ne-
" ceſſity common to all cauſes. And
" though this reaſoning may contradict
" the ſyſtems of many philoſophers, in
" aſcribing neceſſity to the determinations
" of the will, we ſhall find, upon reflec-
" tion, that they diſſent from it in words
" only, not in their real ſentiment. Ne-
" ceſſity, according to the ſenſe in which
" it is here taken, has never yet been re-
" jected, nor can ever, I think, be reject-
" ed by any philoſopher. It may only,
" perhaps, be pretended, that the mind
" can perceive, in the operations of mat-
" ter, ſome farther connection between the
" cauſe and the effect; and a connection
" that has not place in the voluntary ac-
" tions of intelligent beings. Now, whe-
" ther it be ſo or not, can only appear up-
" on examination; and it is incumbent
" on theſe philoſophers to make good their
" aſſertions by defining or deſcribing that
" neceſſity, and pointing it out to us in
" the

"the operations of material cauſes."—— And in a ſubſequent paſſage he proceeds thus: "It is univerſally allowed, "that nothing exiſts without a cauſe of "its exiſtence; and that chance, when "ſtrictly examined, is a mere negative "word, and means not any real power, "which has any where a being in na-"ture. But it is pretended, that ſome "cauſes are neceſſary, ſome not neceſſary. "Here then is the advantage of defini-"tions. Let any one *define* a cauſe, with-"out comprehending, as a part of the de-"finition, a *neceſſary connection* with its "effect; and let him ſhew diſtinctly the "origin of the idea, expreſſed by the de-"finition, and I ſhall readily give up the "whole controverſy."

Theſe few paragraphs of Mr HUME's Eſſay appear to me to contain many of the firſt principles of a ſyſtem of falſe ſcience; and to one who was diſpoſed, and thought himſelf qualified for ſuch a work, they would afford an opportunity for almoſt endleſs diſcuſſion. I ſhall beg leave to offer a few obſervations on thoſe parts of them

them only which are moſt immediately connected with the ſubject of my Eſſay.

In the firſt place, There is a manifeſt ambiguity in the phraſe *Neceſſary connection.* This indeed is acknowledged by Mr HUME himſelf; but is not ſufficiently conſidered and explained by him.

The phraſe *Neceſſary connection* may be ſuppoſed to mean a connection which from the nature of things *muſt* take place, or, more accurately ſpeaking, according to the laws of human thought, *muſt* be conceived by us to take place; the contrary of it, or any ſuppoſition inconſiſtent with it, being not merely falſe, but either intuitively or demonſtrably impoſſible and abſurd. Of this nature are all the relations in geometry; and many relations in various other ſubjects; ſeveral of which neceſſary relations, though of the higheſt importance in ſcientific inveſtigations, have never yet been conſidered with that attention which they deſerve.

If Mr HUME meant that mankind have

a propenſity to believe, that they perceive ſomething like a neceſſary connection of this kind between the cauſe and the effect in the material world, he was certainly miſtaken, and deceived by the ambiguity of a word.

The bulk of mankind, far from having ſuch a belief, never heard nor ever dreamed of ſuch a queſtion or ſuch a ſuppoſition; and I ſuſpect it will be found no eaſy matter to make them comprehend the queſtion, or underſtand the difference between a ſtrictly neceſſary truth and a merely contingent truth of arbitrary appointment, which might have been otherwiſe if it had ſo pleaſed God.

That a few individuals have held that the ultimate facts or laws of phyſics with reſpect to the relation of cauſe and effect are neceſſary truths, as much as thoſe of geometry, cannot be diſputed. But this is of little conſequence in the preſent queſtion: For, beſides the ſmallneſs of the number of thoſe who have thought that the ultimate facts in phyſics were either ſelf-

ſelf-evident, or demonſtrable *a priori* as neceſſary truths, there can be no doubt, that ſuch an opinion, whether right or wrong, is the reſult of deep inquiry and reaſoning: but the bulk of mankind have never been accuſtomed to inquire or reaſon on ſuch ſubjects.

Though we have no reaſon to believe, we may for once, and for the ſake of the argument to which the hypotheſis leads, ſuppoſe, with Mr HUME, that mankind in general have conceived ſome ſtrictly *neceſſary connection* between particular cauſes and their effects in phyſics, and that, feeling no ſuch *neceſſary connection* between their own voluntary determinations and actions and the motives of them, they have thence been led to think, that the relation of Cauſe and Effect and that of Motive and Action were different, and that the former being neceſſary, and the latter not, voluntary agents had a kind of power or liberty in their actions which bodies had not with reſpect to the changes which occur in them.

It muſt be obſerved, that this would be a very ſtrange and falſe inference from the ſuppoſed premiſes: For ſurely ſnow would melt with heat, a ſtone, when unſupported, would fall to the ground, and a billiard-ball would move on being ſtruck, with equal certainty, and with equally little pretenſions to liberty, whether the three phyſical laws alluded to in theſe three inſtances of cauſe and effect be neceſſary truths, like thoſe of geometry, or only contingent truths of poſitive appointment, according to the will of the Supreme Being, ordering what he ſaw to be beſt. Nor would the caſe be different with reſpect to Motives and Actions, if the ſame relation, not of neceſſity, but only conſtant conjunction, were conceived to ſubſiſt between them.

But admitting, in compliment to Mr HUME, that all mankind believed what not one in ten thouſand of them ever thought of, and that all of them with one conſent drew from what they ſo believed an inference ſo palpably falſe, that it is ſcarce credible that any one individual

ſhould have drawn it, or thought of it; then I think it follows *neceſſarily*, that whenever a perſon is ſatisfied that there is not, or even that he has no reaſon to think that there is, any ſuch *neceſſary connection* between particular phyſical cauſes and their effects, he muſt inſtantly become a convert to the doctrine of Neceſſity as explained and aſſerted by Mr HUME, in his reconciling project. For there would then be left no difference perceptible to him, or even conceivable by him, between the two relations which he was wont to diſtinguiſh. But this concluſion, which is an evidently neceſſary inference from Mr HUME's doctrine on this point, is experimentally falſe; therefore the doctrine of which it is a neceſſary inference muſt be erroneous.

The diſavowal of any belief of a *neceſſary connection*, perceptible or intelligible to us, between particular phyſical cauſes and their effects, ſeems to be very fully implied in the modern and only ſucceſsful way of conducting phyſical inquiries; I mean, by obſervation, experiment, and induction.

This

This method has been followed by the moſt eminent philoſophers who have flouriſhed ſince the days of GALILEO and BACON; yet it will ſcarce be pretended that they have all been convinced of the neceſſity of human actions as maintained by Mr HUME, and conſiſting in the ſameneſs of the two relations of cauſe and of motive; nor yet will it be ſaid, by any reaſonable man, that they have in general been ſo ſtupid as not to judge that things were the ſame between which they neither knew nor ſuppoſed that there was any difference.

But if a metaphyſician ſhould be found bold enough to aſſert either or both of thoſe ſtrange propoſitions, ſtill it would avail nothing; for many perſons of good ſenſe, liberal education, and much knowledge, may eaſily be found, who are thoroughly convinced that they know nothing of any *neceſſary connection* between phyſical cauſes and their effects; and yet cannot be perſuaded that the relation of motive and that of cauſe are the ſame, nor be brought to acquieſce in the doc-

trine of Neceſſity, even as defined by Mr HUME.

And even if this ſhould be diſregarded, or conſidered as mere prejudice, obſtinacy, and ſtupidity, it may be fairly demonſtrated, from a careful examination of the phænomena of cauſes and effects in phyſics, and of the motives and actions of men, and from a compariſon of them with one another, that the two relations in queſtion, admitting that there is no ſtrictly *neceſſary connection* perceptible or intelligible to us in either of them, are yet eſſentially different.

Yet I think it can ſcarce be doubted by any one who attends to the whole tenor of Mr HUME's reaſoning on this ſubject, that it was ſuch a kind of *neceſſary connection* as has juſt been conſidered, that he conceived mankind had a propenſity to believe took place in the relation of cauſe and effect in phyſics: for he always contraſts it with the relation of *conſtant conjunction*, and endeavours to explode the former, while he eſtabliſhes the latter.

There

There is indeed another ſenſe of the phraſe *Neceſſary connection* taken notice of by Mr HUME himſelf, in which alone I apprehend it has commonly been applied by mankind to the relation between phyſical cauſes and their effects; and by them ſuppoſed, I believe very rightly, to take place in it, but not in the relation of motive and action. The ſenſe of the phraſe *Neceſſary connection*, to which I here allude, is what Mr HUME has with much greater propriety called *regular, uniform, conſtant conjunction.* Other words might eaſily be employed to denote the ſame meaning; ſuch as, inſeparable connection, or, more ſtrictly ſpeaking, a connection which men cannot ſeparate. But it would be very fooliſh to multiply words on ſo plain a ſubject. All that is meant by ſuch phraſes is, that when the *cauſe* is applied to the *ſubject*, its *effect* will always and inevitably take place; and that the body has no power either of changing its own ſtate, or of preventing that change which the cauſe applied was fit to produce; that is, no power of ſeparating a cauſe from its effect.

This

This kind of *neceſſary connection*, which, in compliance with Mr HUME's very juſt obſervations, I ſhall henceforth call, not *neceſſary*, but only *uniform*, *regular*, *conſtant*, or *inſeparable* connection or conjunction, mankind have not believed to take place in the relation of motive and action, as it ſeems to do in that of cauſe and effect in phyſics; nor ought they to believe it.

Mr HUME indeed has ventured to ſay, that "*This neceſſity* (meaning conſtant conjunction) *has never yet been rejected, and (he thinks) never can be rejected by any philoſopher*," with reſpect to the motives and actions of men.

I by no means lay claim to the character of a philoſopher, more eſpecially according to what muſt be ſuppoſed to have been Mr HUME's ſenſe of that term; but as a plain man, judging of a very plain ſubject, which is level to every capacity, I ſay with confidence, that even *that* kind of neceſſity of human actions *muſt* be rejected; becauſe it is *demonſtrably certain*, that there is

no

no ſuch conſtant conjunction between motives and actions as there ſeems to be between cauſes and effects in phyſics.

"It may only perhaps be pretended, "that the mind can perceive in the ope- "rations of matter ſome farther connec- "tion between the cauſe and the effect; "and a connection that has not place in "the voluntary actions of intelligent be- "ings.—And it is incumbent on theſe "philoſophers to make good their aſſer- "tion, by defining or deſcribing that ne- "ceſſity, and pointing it out to us in the "operations of material cauſes."

Mr HUME has been very raſh in this argument. It is plainly one thing to perceive and be able to ſpecify ſome farther connection between cauſe and effect in phyſics than what ſubſiſts between motives and the voluntary actions of men, and quite another thing to perceive any *neceſſary* connection in the former caſe. The former of theſe things is certain and ſelf-evident, and even demonſtrable to thoſe who may reject the evidence of conſciouſneſs

ſciouſneſs in ſuch a caſe: the latter is very doubtful, and for aught I know a queſtion of ſuch a kind as the human faculties cannot properly judge of.

But I do not mean in this place to offer any opinion on ſo difficult and ſo abſtruſe a point. It is certainly an important one, and deſerves to be diſcuſſed, were it only that we may know whether it be within the reach of our faculties or not: for many plauſible things may be ſaid on both ſides of this preliminary queſtion.

Inſtead, therefore, of its being incumbent on thoſe (no matter whether philoſophers or not) who deny Mr HUME's doctrine on this ſubject, to define and to point out any *neceſſity* in the relation of cauſe and effect, or ſomething *further* in it than that conſtant conjunction which Mr HUME acknowledges, it is perfectly ſufficient, I apprehend, that they point out or define ſomething *leſs* than that conſtant conjunction in the relation of motive and action. And this I am ſure may very eaſily

eaſily be done; and it is part of what I undertake to do myſelf.

" Let any one define a cauſe without " comprehending as a part of the defini- " tion a neceſſary connection with its ef- " fect, and let him ſhew diſtinctly the ori- " gin of the idea expreſſed by the defini- " tion, and I ſhall readily give up the " whole controverſy."

There is ſomething very extraordinary, and to me I muſt own incomprehenſible, in this kind of defiance. Mr HUME did not, and could not ſurely, mean, that it was impoſſible, or even difficult, to give a definition of a cauſe, without including neceſſary connection with its effect; for he has given two or three ſuch definitions himſelf. And he muſt have known, that though it may be difficult or impoſſible to give a good definition of a cauſe, yet nothing can be eaſier than to ſubſtitute, in any definition of it, the words *conſtant*, *uniform*, *regular*, or *inſeparable conjunction*, for the words *neceſſary connection*. And this, for my own part, I am very willing to do:

nor am I acquainted with any man of ſcience who would have any objections to do the ſame.

As to the inſinuation, that it is incumbent on a perſon who gives any definition of a cauſe which does not comprehend a neceſſary connection with its effect, to give an account how he came by ſuch a notion, or, in Mr HUME's language, to ſhew diſtinctly the origin of the idea expreſſed by the definition, perhaps it would be ſufficient to obſerve, that it is a very ſuperfluous, and almoſt a ridiculous piece of caution, to guard againſt an impoſſible danger: I mean, the being impoſed on by a falſe *idea*; that is, by ſomething pretending to be an *idea*, but really not one. A definition that expreſſes the meaning of the perſon who gives it, whether right or wrong, nay the proper, that is, the intelligible and conſiſtent uſe of a word, is complete proof, that the perſon giving the definition, or uſing the word, had ſome thought, notion, or *idea*, correſponding to it. And Mr HUME, or any who have adopted his ſyſtem, would do well to acquieſce

quieſce in the exiſtence, though perhaps not in the juſtneſs or reaſonableneſs of ſuch an *idea*, and to take it for granted that it was copied in due form from a correſponding impreſſion, (for this is what Mr HUME conſiders as the only origin of an idea). The want of ſuch an *impreſſion* correſponding to any idea, may well ſhake the whole fabric of Mr HUME's philoſophy, by ſhewing, either that we may have *ideas* which are not copied from impreſſions, or elſe that we may have objects of knowledge which are neither impreſſions nor ideas; but can never have the ſmalleſt tendency to convince any man in his ſenſes, that he does not underſtand a definition which he gives in plain language, or a word which he uſes in its common acceptation. Now, to have ſuch an underſtanding or conception (even according to Mr HUME's own acknowledgement) is either the ſame with having an *idea*, or implies the having one. And if it be thought that this notion, conception, *idea*, or thought, is improper or groundleſs, as having nothing correſponding to it in nature, this may be ſhewn by careful inveſtigation of the

things to which it relates; and when this is ſhewn, the notion muſt be given up, like the *vortices* of DES CARTES, or the philoſophical doctrine of ideas.

SECT.

SECT. II.

Remarks on the commonly aſſumed principle, That nothing exiſts, or that no event comes to paſs, without a cauſe.—Obſcurity and ambiguity of this principle, from the vague meaning of the term Cauſe.—*According to the extenſive, generic, metaphyſical ſenſe of the term* Cauſe, *it muſt be admitted as univerſally and neceſſarily true;—but then it bears no relation to the queſtion of Liberty and Neceſſity.—In the limited, ſpecific, phyſical ſenſe of the term* Cauſe, *it muſt not be admitted,* 1ſt, *as being almoſt a begging of the queſtion;* 2dly, *as being unſupported by any evidence.—The queſtion of the univerſality of Motives for every Action to be avoided, as requiring an appeal to conſciouſneſs.—Thoſe Actions alone to be conſidered, and compared with phyſical Effects, for which there are evident and acknowledged Motives.*

ANOTHER argument urged by Mr HUME on this point appears to me to deſerve particular attention; not as being

ing new, or peculiar to him, but as being commonly inſiſted on by thoſe philoſophers who have eſpouſed the ſame ſide of this queſtion that he has done; which implies two things with reſpect to it: *1ſt*, That it has very generally appeared to philoſophers plauſible at leaſt, if not abſolutely ſatisfactory and concluſive; *2dly*, That no complete anſwer or refutation has yet been given to it by thoſe men of more vulgar underſtandings, for whoſe inſtruction and conviction it was intended, and has often been urged, but in vain.

" It is univerſally admitted," ſays Mr HUME, " that nothing exiſts without a " cauſe of its exiſtence."

Before this propoſition, which is ſaid to be univerſally admitted, can rationally be either admitted or denied, it is neceſſary that it be firſt clearly underſtood; which I will venture to ſay it has not in general been, either by thoſe who aſſerted, or by thoſe who admitted it.

It muſt be obſerved, in the *firſt* place, That,

That, whatever may be its moſt proper and philoſophical meaning, the moſt common and popular meaning of the word *Cauſe*, that is to ſay, the notion uſually denoted by it, and therefore moſt likely firſt to occur to any ordinary perſon to whom ſuch an argument may be addreſſed, does not relate to mere *exiſtence*, as it is made to do in this argument or propoſition, but to *event*; and hardly to every *event*, but only to *change*, not to the beginning or to the end of *exiſtence*, that is, to *creation* or *annihilation*; nay, hardly to every kind of *change*, but to thoſe *changes* only which come to paſs in beings that do not produce them in themſelves, and in whom they are conceived to come to paſs in conſequence of the influence of ſomething elſe, or of a certain relation between the ſubject in which the change occurs, and ſomething elſe, to which ſomething elſe the name *Cauſe* is uſually given, as that of effect is to the change proceeding from it.

This alteration, and the ſubſtitution of a new correlative to the term *Cauſe*, implies

plies an alteration in the conception of the relation expreſſed by it; of which an attentive and careful reaſoner would probably be ſenſible, and might rationally ſcruple to admit ſuch a propoſition, at leaſt till he had it fully explained and illuſtrated to him by proper definitions and examples. And if he found, which I preſume would be the caſe, that the uſual meaning of the term *Cauſe* was either extended, or limited, or perverted, in ſome of thoſe examples, or that it was different in the different examples; then, inſtead of either admitting or denying the propoſition in queſtion, he ought undoubtedly to require that thoſe different meanings ſhould be expreſſed diſtinctly and accurately in ſeparate propoſitions, that he might know which of them, or whether any of them, were to be either admitted or denied.

But as this impropriety of making the term and the notion of *Cauſe* relate to mere exiſtence, is no peculiar fault of Mr HUME, being common to him and many other philoſophers, and as a complete diſcuſſion

cuſſion of it would require a much longer inveſtigation than would be proper in this place, I ſhall not here inſiſt any further on it.

Setting aſide, therefore, that circumſtance of incongruity between the notion of cauſe and that of mere exiſtence, and ſuppoſing Mr HUME, and thoſe other philoſophers who have eſpouſed the ſame ſide of the queſtion with him, to have meant to have ſaid only, "That it is univerſally admitted, "that there is no event, that is, no be-"ginning of exiſtence, no end of exiſt-"ence, no change of the ſtate or mode of "exiſtence, not even the action of a li-"ving ſentient intelligent being, without "a cauſe," which, from the general tenor of their reaſonings, ought in candour to be regarded as their meaning; ſtill there would be much need of an explanation of the term *Cauſe*, that is, a preciſe ſpecification of the notion expreſſed by it; and till ſuch explanation were given of it, either by ſtrict logical definition, or by very ample illuſtration, and many examples, the propoſition in queſtion could not

with any propriety be either admitted or denied.

For inſtance, it might reaſonably be aſked, Is the word *Cauſe* employed in that general fourfold ſenſe mentioned by ARISTOTLE, and applied equally to the eſſence or form of a being, to the matter of it, to the efficient or agent, and to the motive, or purpoſe, or final cauſe? Or is it employed in its more common and limited acceptation, as generally uſed in phyſics, and indeed in popular diſcourſe, as when we ſay, "Heat is the cauſe of "expanſion," excluding all the other meanings of it, and particularly that of the agent? Or is it employed in that more limited ſenſe in which it hath been defined and uſed by ſeveral philoſophers, to denote excluſively the agent, in contradiſtinction to the phyſical cauſe? Or is it uſed to expreſs the vague notion inſinuated by ARISTOTLE's Τὸ οὗ ἕνεκα, comprehending all theſe already mentioned, and many more; for example, what the parts are to the whole, what a right angle in a triangle is to the proportion between the ſquares

ſquares of the ſides of it, what the abſence of a pilot is to a ſhipwreck, what the ſeed is to a plant, what a father is to his ſon, what the removal of an oppoſing cauſe is to any event or effect? &c. &c.

If it be uſed in the more vague and comprehenſive meaning expreſſed in the firſt and fourth of theſe queries, it would ſignify nothing as to the queſtion about the relation of motive and action, or the neceſſity of human actions, though it ſhould be admitted that every event, even a voluntary action, had a cauſe. For whatever might be the relation between motive and action, or whether in any caſe the agent acted without motives, or according to motives, or in oppoſition to all motives, ſtill we ſhould have no event nor action without a cauſe; the agent would be the cauſe of it; the efficient; Το ἐξ οὐ; that without which it would not (or could not) have been what it was. According to the meaning alluded to in the fourth query, even the removal of an oppoſing cauſe ſhould be a ſufficient cauſe for an event: For inſtance, the breaking of a rope, the cauſe of any thing which

hung by it falling to the ground. But it is very plain that Mr HUME could not have ſuch a meaning in view: we therefore may ſafely ſet that ſuppoſition aſide.

As little could he have in view the meaning expreſſed in the third query, in which meaning Dr REID (I own I think with too little regard to the common uſe and application of the word *Cauſe*) hath employed it in arguing this queſtion, *Eſſays on the Active Powers, paſſim*; as where he ſays, after admitting that every thing muſt have a cauſe, That in the caſe of voluntary actions, it is not the motive, but the perſon, that is the cauſe of them. This meaning of the term *Cauſe*, to wit, a Being having power (and optional or diſcretionary power) to produce or not to produce a certain change, is not only evidently different from Mr HUME's, but completely repugnant to his whole ſyſtem. We may therefore ſet it aſide too.

There remains, then, only the ſecond of the meanings ſtated in the queries to be conſidered; that which the term *Cauſe* has in

in phyſics, and moſt commonly in popular diſcourſe.

According to this meaning of the term *Cauſe*, the propoſition or principle ſuppoſed to be univerſally admitted amounts preciſely to this: "That nothing exiſts, "that no event comes to paſs, that no "action is done, that has not, or had not "at leaſt, ſomething ſtanding in the very "ſame relation to it that any cauſe in "phyſics ſtands in to its effect: For in-"ſtance, impulſe to the motion of a body "that was free to move, or heat to ex-"panſion, to fuſion, or to evaporation."

From the general tenor of all Mr HUME's reaſonings on this ſubject, from the ultimate concluſions that he ſeems to have believed he had eſtabliſhed, from the examples and illuſtrations which he hath given, and above all from the mention of the ſpecific circumſtance of conſtant conjunction, ſo often and ſo ſtrongly inſiſted on by him as the chief or only thing that we knew, or from the nature of our faculties could know, with reſpect either to the

the relation of phyſical cauſe and effect, or of motive and action, I think it cannot reaſonably be doubted, that his meaning by the propoſition in queſtion was preciſely that which is more fully and clearly ſtated in the preceding paragraph.

If ſuch be the meaning of it, the anſwer to it muſt be very plain and eaſy: That aſſumed principle, far from being univerſally admitted, has not even been heard or thought of by one in ten thouſand of the human race. And when it is clearly ſtated to them, it may reaſonably be doubted, whether one in ten thouſand of them will admit it; and it cannot be doubted by thoſe who attend accurately to the different relations among things and events which we are able to perceive and judge of, that it ought not to be admitted by any perſon. Mankind naturally conceive the relations of agent, motive, and phyſical cauſe, to be very different in ſome reſpects, though the ſame in others. And, in particular, they ſeem very generally to have believed, that their own voluntary determinations and actions (in one ſenſe

of

of the term *Action*) do not ſtand in that relation to any perſon or thing whatever. The former of theſe points appears very clearly from the evidence of language, even ſetting aſide all regard to conſciouſneſs, or all faith in mens direct attention to their own thoughts. The latter of them appears very plainly from the general repugnance of men to admit, when firſt ſtated to them, the philoſophical doctrine of Neceſſity, as conſiſting in the perfect ſameneſs of the relation of motive with that of phyſical cauſe. We neither know nor conceive any other cauſe, or τὸ ἐξ οὐ, for our own determinations and direct ſimple actions, than ourſelves, and the motives of them. It is ſelf-evident, that the relation between the perſon himſelf, or agent, and the action, is widely different from that of phyſical cauſe and effect; and if it were ſuppoſed that the action ſtood in the relation of phyſical effect to any cauſe, there could remain nothing ſuppoſed or conceived by us, but the motive, that might be regarded as ſuch a cauſe of the determination and action. And this accordingly is the very doctrine maintained

with reſpect to motives and actions by Mr LEIBNITZ, Mr HUME, Dr PRIESTLY, and many other modern philoſophers: and this doctrine Mr HUME has endeavoured to ſhow to be not inconſiſtent with the common notion of the relation of motive and action; in which attempt I do not think he has by any means ſucceeded. There is among mankind a very general, and what I think may be ſhewn to be a well-founded, repugnance to that doctrine, as well as to the principle, (as already explained by a ſort of paraphraſe), that Mr HUME would aſſume as univerſally admitted, which would imply its being ſelf-evident.

Indeed that principle, (according to his meaning of the term *Cauſe*), which he is for aſſuming as univerſally admitted, is ſo very nearly the ſame with the ultimate concluſion or doctrine which he meant to eſtabliſh by means of it, that not only the latter is evidently implied in the former, but it even requires much care and attention to diſtinguiſh the one from the other; which I am convinced Mr HUME had

had no thoughts of ever doing; and therefore, as to him, the aſſuming of that very plauſible principle was no better than a complete begging of the queſtion which he wanted to ſettle.

In ſtrict reaſoning, to be ſure, it was not juſt begging the queſtion; for it might be admitted, without admitting that the motive was the cauſe of the action; of which it might be ſuppoſed that either the agent or ſome third thing, unnamed and unthought of, was properly the cauſe. But as Mr HUME does not appear ever to have thought of theſe ſuppoſitions, and as they are quite repugnant to his whole ſyſtem, they are with reſpect to his aſſumed principle as if they were not.

This long diſcuſſion ſeemed neceſſary in order to remove that obſcurity with reſpect to the principle in queſtion which proceeds from the ambiguity of the term *Cauſe* employed in expreſſing it; and thereby enable us either to deny it without contradicting the univerſal and irreſiſtible conviction of mankind, that certain things

muſt have a cauſe, or to admit it without giving up the ultimate point at iſſue, without even the ſhadow of a reaſon for ſo doing.

In Mr HUME's ſenſe of the term *Cauſe*, the principle, That nothing exiſts without a cauſe, muſt be denied; firſt, as being, in other words, a taking for granted of a much diſputed point which he had undertaken to prove; ſecondly, as being unſupported by any evidence of obſervation, experiment, induction, conſciouſneſs, intuition, or demonſtration.

In that more extenſive and even vague ſenſe of the term *Cauſe*, for which authority may be found both in common diſcourſe and in the writings and converſation of many philoſophers, Mr HUME's aſſumed principle is to be admitted; but under a kind of proteſt, and with certification, that in it nothing is admitted or implied with reſpect either to the ſameneſs or the difference of the relations of agent and action, motive and action, or phyſical cauſe and effect; theſe queſtions remaining

remaining to be ſettled afterwards in the only way in which they can be ſettled; by ſtrict induction from accurate obſervations and experiments with reſpect both to the laws of human thought, and to the phænomena or matters of fact, in human actions, and the motives of them, and in phyſical effects, and the cauſes of them.

If by the aſſumed principle, "That no-"thing exiſts without a cauſe of its exiſt-"ence," Mr HUME, and thoſe other philoſophers who are fond of maintaining it as an important axiom in ſcience, mean no more than that there is no phyſical effect, either in things inanimate or in living creatures, without a phyſical cauſe; and that there is no beginning of exiſtence, or creation, without a creator; no action, without an agent; no ſpeaking, without a ſpeaker; no poem, without a poet; no picture, without a painter; no building, without a builder; no contrivance, without a contriver; no work of deſign and intelligence, without an intelligent author; I think the propoſition

ſhould be admitted without reſerve, as not only univerſally but neceſſarily true, as much as any axiom of geometry: I neither know of any exception to it, nor can I believe there ever ſhould be one: nor have I any reaſon to think that any man of ſenſe (putting out of the queſtion ſcience or knowledge acquired by ſtudy) can be of a different opinion.

If any philoſopher wiſhes particularly (no matter for what reaſon) to apply the term *Cauſe*, not in a metaphorical meaning, which might be ſuggeſted by various circumſtances of reſemblance or analogy, but in a ſtrictly literal and ſcientific meaning, to the Creator, the agent, the poet, the ſpeaker, the intelligent author of any kind, as well as to the motive, and to the phyſical cauſe, I think he ſhould be gratified in his wiſh: for it is folly to diſpute about a word; and no evil can ariſe from complying with ſuch a requeſt, provided only we attend to the nature and all the circumſtances of it.

According to the unalterable laws of human

human thought, and the eſtabliſhed principles of all languages, the term *Cauſe*, applied in that way, would be a generic term, expreſſing only what was in common among all the things called *Cauſes*, but nothing peculiar to any one of them, whether already known or hereafter to be diſcovered. Juſt as the terms *Being*, *Animal*, *Beaſt*, expreſs only things common to certain comprehenſive *genera*, but nothing peculiar to the ſeveral inferior *genera* of beaſts.

If there ſhould be occaſion (as in the preſent inquiry there is) to attend to the more minute or ſpecific differences among the ſeveral things comprehended under the *genus Cauſe*, it would be highly expedient, or rather abſolutely neceſſary, to give to each of them a ſpecific name, were it only an addition to the generic name *Cauſe*: For example, to call the Creator the firſt cauſe, or the creative cauſe, the agent the efficient cauſe, the author the intelligent cauſe, and that which is commonly in phyſics termed ſimply a *Cauſe*, the phyſical cauſe. Then, and not before, it would be

be poſſible to reaſon about the ſpecific differences of them without any riſk of obſcurity, ambiguity, or miſunderſtanding. But were a philoſopher, on the ſtrength of having found or got the general name of *Cauſe* applied to all thoſe things, to deny, or to diſregard the ſpecific differences among them, he would be acting as abſurdly as one who ſhould maintain, that there was no difference between a father and a mother, becauſe they are both termed Parents; and none between a bird and a fiſh, becauſe both are acknowledged to be animals.

On the ſame principle ſhould he propoſe, like ARISTOTLE, to give the name of *Cauſe* to the removal or ceaſing of an oppoſing cauſe, he might be gratified in it without any inconvenience in ſcience, or in reaſoning about cauſes, provided only due attention were given to the difference between ſuch a kind of cauſe and all other kinds of cauſes, and a different ſpecific or *trivial* name were employed to denote it, and diſtinguiſh it from them: For example, if it were called an *occaſional Cauſe*.

This

This term I ſuggeſt merely by way of illuſtration; not as thinking it a proper one: it would be very improper to uſe it in this ſenſe, becauſe it has already got another meaning well known in medicine. But any ſpecific addition to the term, not already uſed in a different ſenſe might be uſed to denote this particular kind of cauſe.

On the ſame conditions, too, the motive to any action may be termed the *Cauſe* of it; for example, if it be called the *Final Cauſe*. This has often been done: for, in conſequence of the cloſe and ſtriking analogy between motives and thoſe things moſt commonly termed *Cauſes*, (to wit, phyſical cauſes), the ſame general name has frequently been applied to both; and ſuch a ſpecific addition to it has already been found convenient or neceſſary in diſcourſe and reaſoning.

But with reſpect to this laſt ſpecies of cauſe, ſomething further muſt be attended to. If it be thought right (of which I can have no doubt) to ſay, that in the moſt

moſt ordinary actions of men, and more eſpecially in all deliberate and important actions, there is ſome final cauſe for the action, that is, ſome motive according to which the perſon acted, of which motive or final cauſe the perſon is conſcious, and which he therefore can ſpecify, all this *muſt* be admitted as intuitively certain, and acknowledged by every intelligent and candid perſon.

But if any perſon would aſſume as a ſelf-evident principle, (as many are eager to do), That for every action, without exception, there *is* and *muſt be* a motive or final cauſe, juſt as there muſt be an agent or efficient cauſe; or as for every change of ſtate in a being that does not change its own ſtate, there muſt be a phyſical cauſe; or as for the beginning of exiſtence, there muſt be a creator; this ought not to be admitted; for it is at beſt doubtful, and a matter of keen diſpute among men of ſeemingly competent judgement, and knowledge, and candour, and opportunities of obſerving. Thus, while ſome ſay that they feel it ſo univerſally in themſelves,

and

and firmly believe it to be ſo in all mankind; others, on the contrary, as poſitively aver, that they are conſcious of no ſuch motive, and can hardly conceive any ſuch, for chooſing one of ſeveral equal chances, one card out of a pack, one guinea out of a heap, &c. which yet they can do with perfect eaſe whenever they are deſired to do ſo. While this queſtion remains undecided, and even ſo direct a contradiction about it continues among men of ſcience, it would ſurely be wrong to take for granted either opinion. It muſt be left for future diſcuſſion, if it ſhall be thought to deſerve any; which I own I think it will. For though it be almoſt (or altogether, as ſome will think) frivolous in morals, or in judging of the merit of human actions in point of wiſdom or virtue, it may be of great importance in the hiſtory and philoſophy of the human mind: it may be of as much conſequence in this branch of ſcience as the *inertia* of body is in phyſics.

I cannot, however, undertake the diſcuſſion of it conſiſtently with my plan of

neither making nor admitting any appeal to conſciouſneſs; which for many reaſons I anxiouſly wiſh to avoid: and it is certainly difficult, if not impoſſible, to ſettle it without making ſome ſuch appeal.

Poſſibly the inveſtigation of thoſe other points relating to the ſame ſubject, which I think may be fully aſcertained without any appeal to conſciouſneſs, will throw ſome light on it, and put us in the way of ſettling it without diſpute or contradiction.

For it muſt be obſerved, that even if it ſhould be granted, that for every action there muſt be a motive as well as an agent, ſtill the important queſtion of the nature of the relation of motive and action, and its being the ſame with, or different from, that of phyſical cauſe and effect, would remain entire.

For we are not to conſider and reaſon about Beings deſtitute of appetites, paſſions, deſires, judgements of duty, honour, intereſt, and all other conſiderations uſually termed

termed *Motives*; nor yet about actions, that either bear no relation at all to ſuch motives, or are conſtantly in oppoſition to them; we are to conſider men having ſuch principles of action, and actions proceeding from and referable to ſuch motives: For example, actions according to the only motive, or the concurrent motives, that are preſent, or, as we commonly expreſs it, applied to the perſon or agent; and when different or directly oppoſing motives are applied at the ſame time, according to ſome, and in oppoſition to others of them. And it is juſt the difference between ſuch inſtances of actions proceeding from or related to motives and inſtances of what are commonly called *Cauſes* and *Effects* in phyſics which I propoſe to *demonſtrate*, and the neceſſary inferences from that difference that I propoſe to trace in the following ſections of this Eſſay.

SECT. III.

General Plan of the reaſoning employed in this Eſſay;—to admit the doctrine of Neceſſity unqueſtioned as a principle;—to reaſon from it by neceſſary conſequences, ad falſum *and* ad abſurdum.—*Juſtification of the uſe of Mathematical reaſoning on this ſubject;—poſſibility of applying it;—advantages of it,—ſimplicity,—perſpicuity,—preciſion,—comprehenſiveneſs;—certainty of its principles;—confidence in the perception of neceſſary relation at every ſtep, and conſequently in the whole of it.—Diſtinctneſs of the notion of Quantity, both proper and improper;—the various relations of Quantity familiar to us.—Whole chain of reaſoning before us at once;—improbability of committing any error in it;—facility and certainty of detecting any error that may be committed in it;—impoſſibility of cavilling or diſputing about ſuch an error.—Prerogative of Mathematical reaſoning;—authority*

rity of it higher than that of unaſſiſted judgement, or of any other mode of reaſoning;—to be tried only as good or bad of its kind;—if good, it is ſupreme and concluſive.

THOUGH I can by no means acquieſce in Mr HUME's opinions and reaſonings concerning the nature of the relation between motives and actions, and the perfect reſemblance between it and the relation of cauſe and effect in phyſics, and can never admit the philoſophical doctrine of the neceſſity of human actions as explained and aſſerted by him; yet I muſt do Mr HUME the juſtice to own, that I have found in his Eſſay on Liberty and Neceſſity one general propoſition or principle, which appears to me ſuch plain and obvious good ſenſe, that I ſhall without ſcruple adopt it as the fundamental principle of my own reaſonings on the ſame ſubject, convinced that no man of ſenſe can ever ſeriouſly call it in queſtion, or ever think of diſſenting from thoſe concluſions to which it leads.

"What-

" Whatever definition we may give of " Liberty, (ſays this celebrated philoſo- " pher), we ſhould be careful to obſerve " two requiſite circumſtances: Firſt, That " it be conſiſtent with plain matter of " fact; ſecondly, That it be conſiſtent " with itſelf. If we obſerve theſe circum- " ſtances, and render our definition in- " telligible, I am perſuaded that all man- " kind will be found of one opinion con- " cerning it."

I confeſs I have not penetration enough to diſcover, in the common notion of the liberty of human actions, either that inconſiſtence with plain matter of fact, or that inconſiſtence with itſelf, to which Mr HUME ſeems to allude ſo confidently. And I am very ſure that he hath pointed out no ſuch inconſiſtence; and that it was ſcarce poſſible he ſhould have done ſo, even if there were an inconſiſtence between them; for this reaſon, among others, that he does not ſeem to have known, nor ever to have taken the trouble to inquire, what the common notion of Liberty is. But there can be no doubt, that a philoſopher,

even

even of the greateſt genius, eſpecially if he were diſpoſed and accuſtomed to diſregard the common opinions and notions of mankind, might, in conſequence of careleſs or prejudiced obſervation, form to himſelf a notion, and give an account or definition of the popular conception and belief of the liberty of human actions, which ſhould obviouſly labour under one or both of thoſe grievous defects.

Such undoubtedly would be the caſe with any definition of Liberty that ſhould correſpond to what Mr HUME, in the following paſſages, inſinuates, for I obſerve he does not directly aſſert it, to be the common notion on that ſubject.

" For what is meant by liberty when " applied to voluntary actions? We can- " not ſurely mean, that actions have ſo " little connection with motives, inclina- " tions, and circumſtances, that one does " not follow with a certain degree of uni- " formity from the other: for theſe are " plain and acknowledged facts."—They ſurely are ſo; and there would be good reaſon

reaſon to call in queſtion the veracity, as well as the underſtanding, of any perſon who ſhould venture to deny them.

" Nor have philoſophers ever entertained a different opinion from the people in this particular: For, not to mention that almoſt every action of their life ſuppoſes that opinion, there are even few of the ſpeculative parts of learning to which it is not eſſential. What would become of hiſtory, had we not a dependence on the veracity of the hiſtorian, according to the experience which we have had of mankind? How could politics be a ſcience, if laws and forms of government had not a uniform influence upon ſociety? Where would be the foundation of *morals*, if particular characters had no certain or determinate power to produce particular ſentiments, and if theſe ſentiments had no conſtant operation on actions? And with what pretence could we employ our *criticiſm* upon any poet or polite author, if we could not pronounce the conduct and ſentiments of his actors, either natural

" tural or unnatural to ſuch characters,
" and in ſuch circumſtances? It ſeems
" almoſt impoſſible, therefore, to engage,
" either in ſcience or action of any kind,
" without acknowledging the doctrine of
" Neceſſity, and this inference from mo-
" tives to voluntary actions, from charac-
" ters to conduct.

" And indeed, when we conſider how
" aptly *natural* and *moral* evidence link to-
" gether, and form only one chain of ar-
" gument, we ſhall make no ſcruple to al-
" low, that they are of the ſame nature,
" and derived from the ſame principles.
" A priſoner who has neither money nor
" intereſt, diſcovers the impoſſibility of
" his eſcape, as well when he conſiders
" the obſtinacy of the gaoler, as the walls
" and bars with which he is ſurrounded;
" and in all attempts for his freedom,
" chuſes rather to work upon the ſtone
" and iron of the one, than upon the in-
" flexible nature of the other. The ſame
" priſoner, when conducted to the ſcaf-
" fold, foreſees his death as certainly from
" the conſtancy and fidelity of his guards,
" as from the operation of the ax or

" wheel. His mind runs along a certain
" train of ideas; the refuſal of the ſoldiers
" to conſent to his eſcape; the action of
" the executioner; the ſeparation of the
" head and body; bleeding, convulſive
" motions, and death. Here is a con-
" nected chain of natural cauſes and vo-
" luntary actions; but the mind feels no
" difference between them, in paſſing from
" one link to another; nor is leſs certain
" of the future event than if it were con-
" nected with the objects preſent to the
" memory or ſenſes, by a train of cauſes,
" cemented together by what we are plea-
" ſed to call a *phyſical* Neceſſity. The
" ſame experienced union has the ſame
" effect on the mind, whether the united
" objects be motives, volition, and actions,
" or figure and motion. We may change
" the names of things; but their nature
" and their operation on the underſtand-
" ing never change."

" A manufacturer reckons upon the la-
" bour of his ſervants, for the execution
" of any work, as much as upon the tools
" which he employs, and would be equal-
" ly

" ly ſurpriſed were his expectations diſ-
" appointed. In ſhort, this experimental
" inference and reaſoning concerning the
" actions of others, enters ſo much into
" human life, that no man, while awake,
" is even a moment without employing
" it. Have we not reaſon, therefore, to
" affirm, that all mankind have always a-
" greed in the doctrine of Neceſſity, ac-
" cording to the foregoing definition and
" explication of it ?

" A man who at noon leaves his purſe
" full of gold on the pavement at Cha-
" ring-Croſs, may as well expect that it
" ſhall fly away like a feather, as that he
" will find it untouched an hour after."

The caſe of the priſoner endeavouring to make his eſcape, is put by Mr HUME very ingeniouſly, but I think not quite fairly, even for his own ſide of the queſtion. A wretch who has neither money nor intereſt has not the proper inſtruments to work upon an obſtinate gaoler, even according to Mr HUME's own ſyſtem; but ſetting aſide this nicety, and ſuppo-

ſing a felon to have both money to work on his gaoler, and files, and chiſſels, and hammers, to work on his fetters, and on the walls of his priſon, I will venture to ſay, though at firſt it muſt appear a paradox, that he ſhews more knowledge of the relation of cauſe and effect and of that of motive and action, nay that he even reaſons more cloſely and juſtly from the principle of the conſtant conjunction of cauſe and effect in phyſics, than ever Mr HUME did, when, all other circumſtances being equal, he endeavours to employ the file and the chiſſel on the iron and ſtone, rather than the gold on the gaoler: For, knowing the conjunction of cauſe and effect to be conſtant, he is ſure that every ſtroke of his file and of his chiſſel will have its effect, and of courſe bring him nearer to his purpoſe. If he has time enough, and is not interfered with, nor oppoſed in any other way, he is certain of accompliſhing his eſcape; but knowing, or at leaſt believing, that the relation of motive and action is not a conſtant, but an occaſional and ſeparable conjunction, and that it depends on the perſon to whom

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a motive is applied, whether it ſhall be conjoined with its action or not, he is uncertain of gaining his purpoſe by offering to bribe his gaoler; and he knows that he may make a thouſand offers without advancing in the leaſt his deſired eſcape. But this important difference between the two relations in queſtion is to be illuſtrated more fully in the ſequel.

All theſe remarks and reaſonings of Mr HUME plainly proceed on the tacitly aſſumed principle, That there is no medium between that ſpecific relation of conſtant conjunction between motives and actions for which he contends, and no relation or connection at all between them; and as the latter ſuppoſition is notoriouſly falſe, and very fully and clearly proved by him to be ſo, he ſeems to have concluded with confidence, that the former muſt be true; eſpecially as the inſtances in favour of it are innumerable. But we might have expected that a moment's reflection would have ſatisfied the author of the Hiſtory of England, that there might be various relations among things, beſides that of

of conſtant conjunction, and ſuch relations as men might reaſon about as diſtinctly and accurately, though not in the ſame manner, nor on the ſame principles, as they reaſon about the neceſſary relations in geometry, the accidental relation of priority and ſucceſſion in chronology, the conſtant conjunction of cauſe and effect in phyſics, the familiar relations of moral duty, or of civil intercourſe, or the various relations of reſemblance, of analogy, or of contrariety; and a few accurate experiments, or even unprejudiced *obſervations*, might have ſatisfied the philoſopher that the relation in queſtion was by no means a conſtant conjunction; and this without in the leaſt encroaching on the prerogative of a metaphyſician, to diſregard all vulgar opinions, even though the natural ſuggeſtions of the human faculties.

The general principle, however, expreſſed in the paſſage firſt quoted from Mr HUME's Eſſay on this ſubject, ſurely admits of no denial, and ſcarce requires any commentary. I ſhall therefore only ſay,

as

as an expreſſion of my fulleſt aſſent to it, that I conceive that every definition, explanation, or doctrine, of Liberty, of Neceſſity, or of any thing elſe, which either directly, or in its neceſſary conſequences, is inconſiſtent with plain matter of fact, muſt be falſe; and that every ſuch doctrine, which either directly, or in its neceſſary conſequences, is inconſiſtent with itſelf, muſt be abſurd; even though it ſhould be the favourite doctrine of philoſophers, nay, though it ſhould be the general and natural perſuaſion of mankind.

Now, theſe two circumſtances, inconſiſtence with plain matter of fact, and inconſiſtence with itſelf, are the very defects in the philoſophical doctrine of the neceſſity of human actions, as commonly maintained on the principle of their being the effects of motives, and as modified, and explained, and aſſerted by Mr HUME, which I perceive, and undertake to *demonſtrate.*

For as to the other more glaring defect of

it, I mean its inconſiſtence with the natural and uniform conviction of mankind, or what is called their common ſenſe, I know that it muſt go for nothing in this controverſy; and therefore I ſhall never appeal to it. Indeed there are ſtrong reaſons for thinking that the repugnance of the doctrine of Neceſſity to common ſenſe has been the chief recommendation of it. Nay, I ſhall never even venture to appeal to the teſtimony of conſciouſneſs, but, on the contrary, avoid with the utmoſt care every caſe and every argument which either directly or indirectly requires ſuch an appeal: for though conſciouſneſs may ſeem the natural tribunal in ſuch a queſtion as that of Liberty and Neceſſity, and is perhaps the only one that can decide ſome points relating to it; yet as different perſons have given contradictory accounts of its deciſion, it is manifeſt, that either there muſt be a wonderful and irreconcileable difference between the judgements of different men, with reſpect to one of the ſimpleſt and moſt immediate objects of knowledge, or elſe that there has been very groſs prevarication on one ſide or the other

other in this controverſy; and whichever of theſe things be the caſe, it muſt be either needleſs or fooliſh to appeal to ſo variable or ſo corrupted a tribunal as that of conſciouſneſs: nor is there, for the preſent purpoſe, any occaſion to make ſuch an appeal; for it is not propoſed to prove directly any thing to be true, but only to prove ſome things to be falſe which have been aſſerted as truths; and when theſe are proved to be falſe, the direct contrary of them is at the ſame time proved to be true. Now, this may be done, not only without appealing, but without ever paying any regard to conſciouſneſs, or common ſenſe; merely by reaſoning through neceſſary conſequences from the principles which are aſſerted by ſome philoſophers, but denied by the vulgar, to concluſions which are notoriouſly falſe or abſurd. So that, on this principle, the only arguments which I ſhall have occaſion to urge, or ſhall ever preſume to offer, againſt the doctrine of Neceſſity, ſhall be ſuch as would be ſufficient to prove it to be falſe, and *demonſtrate* it to be abſurd, if it had been the common and popular

perſuaſion, and as natural to mankind, and as univerſal among them, as the vulgar belief that the ſun moves every day from eaſt to weſt.

It will no doubt appear extraordinary, and perhaps reprehenſible, that I ſhould venture to employ expreſſions like theſe on ſuch a ſubject, and that I ſhould have the arrogance to think that I can demonſtrate the opinion which I eſpouſe, in oppoſition to the ſentiments, the reaſonings, and the ſuppoſed demonſtrations, of many of the moſt acute and enlightened philoſophers that the world has ever ſeen.

My reaſon for employing the term *demonſtration* ſo confidently muſt appear ſtill more extraordinary, namely, that I propoſe to demonſtrate the falſity and abſurdity of the doctrine of Neceſſity, on mathematical principles, in mathematical form, partly by means of algebraical *formulæ*, partly with the help of diagrams.

But if this circumſtance be duly conſidered,

dered, I truſt it will vindicate me from any ſuſpicion of arrogance. I hope I ſhall never incur the cenſure of contemning the talents or knowledge of the many great philoſophers who have held an opinion different from mine on this point, nor of laying claim to ſuperior talents or knowledge myſelf; yet I think I may be certain, that on the point at preſent in queſtion I am in the right, and they in the wrong, when I employ in the inveſtigation of it an inſtrument or aſſiſtance, and I believe an *infallible* one, not of my invention, but of general and long eſtabliſhed uſe, which they had not thought of employing. *Nec manus nuda, nec intellectus ſibi permiſſus, multum valet: Inſtrumentis et auxiliis res perficitur; quibus opus eſt non minus ad intellectum quam ad manum. Atque ut inſtrumenta manûs motum aut cient aut regunt; ita et inſtrumenta mentis intellectui aut ſuggerunt, aut cavent;* BACON, *Nov. Org.* 1. 2. This ſentiment, which is a juſt and highly important one, is frequently and ſtrongly inculcated by BACON, and illuſtrated very happily by the familiar compariſon of the uſe of the ruler

and compaſſes to draw a ſtraight line or a circle. A man muſt have a wonderful and almoſt incredible ſuperiority over others, who can draw a circle, or a ſtraight line, with his unaſſiſted hand; but with the help of the compaſſes and ruler, any man, or any child, can eaſily draw a ſtraight line or a circle, and may with confidence, and without incurring the charge of arrogance, undertake to do ſo, as well as there is any occaſion, or as well as any other perſon could, and better, or at leaſt more certainly, than any perſon who would not make uſe of the ſame kind of aſſiſtance.

In like manner, a perſon who makes no pretenſions to any extraordinary endowments, either of body or mind, but who, with the help of a teleſcope or a microſcope, ſees the eclipſes of Jupiter's ſatellites, or the circulation of the blood in the limb of an inſect, may without arrogance diſregard the aſſertions even of the greateſt philoſophers, if any ſhould be found ſo unreaſonable as to deny the reality of thoſe things, becauſe they had not been able

able to ſee them, either with their naked eyes, or with ſuch glaſſes as they had been accuſtomed to uſe. Such philoſophers, it may be preſumed, would hardly eſcape cenſure for their arrogance and their obſtinacy.

The ſame may be ſaid in juſtification of the confidence of one of ordinary judgement, and moderate chemical knowledge, who, after carefully examining two foſſils by a variety of experiments, ſhould pronounce them eſſentially different, in oppoſition to the opinion of the greateſt chemiſts in the world, who, without ſuch an examination of them, and plainly on the ſtrength of their obvious reſemblance, had pronounced them to be the ſame.

Still nearer to my ſituation, in the preſent caſe, is that of an accountant or a land-meaſurer, who, after examining a complicated account, or ſurveying an eſtate, can ſwear with confidence to the exact ſtate of the account, or the preciſe extent of the eſtate, though in oppoſition to the previous, and perhaps moſt poſitive

which I diſtruſt, but ſtill by neceſſary conſequences, to concluſions, ſome of which are *falſe*, and others *abſurd*, and none of which ought to be admitted; and of courſe the principles from which they are derived muſt be given up. This method, though not always the moſt eligible, is acknowledged to be of equal authority with the other in mathematical ſcience, and is almoſt as often employed. It has even ſome very important advantages in particular caſes; as in the preſent: it precludes many diſputes concerning what ſhould be aſſumed as firſt principles or evident facts. I aſk for nothing of that kind, but take the doctrine of Neceſſity either as ſtated by its moſt zealous aſſertors, or in any way that it can be ſtated, without admitting that principle which mankind in general believe, and which ſo many philoſophers have denied; and from it, and a few of the plaineſt axioms of geometry, which no body does or can diſpute, draw many inferences, ſome of which are palpably *abſurd*, and others ſo notoriouſly *falſe*, that I believe few people will think it neceſſary to put them to the

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teſt of experiment. But this, if required, may eaſily be done.

Nor muſt it be thought a ſuperfluous labour to point out ſeveral ſuch *falſe* or *abſurd* inferences from the doctrine in queſtion. Any one abſurdity, fairly demonſtrated by neceſſary inferences from it, is complete proof that the doctrine is erroneous. But there may be various hypothetical modifications of or additions to the fundamental principle of the doctrine of Neceſſity; and as the very ſame concluſions do not follow from all of them, and as all of them are to be refuted, it is neceſſary to trace the conſequences of each of them, by demonſtrative reaſoning, to ſome concluſion that is either falſe or abſurd; and from the peculiar nature of the ſubject of the reaſoning, it becomes neceſſary to illuſtrate particularly every ſuch concluſion.

Nor is it by any means ſuperfluous, to conſider thoſe neceſſary inferences from the principle in queſtion which are only *falſe*, but poſſible, as well as thoſe which are *abſurd*

ſurd and impoſſible. The conſideration of thoſe that are only *falſe* ſerves a very curious and even important purpoſe in this inquiry. It enables us to aſcertain the nature of that deception, and confuſion of thought, or rather of words, on this ſubject, in which ſo many ingenious men have been bewildered.

When from any principle, whether ſeriouſly aſſerted as true, or only aſſumed for the ſake of argument, a concluſion is deduced by neceſſary inferences, which concluſion is either abſurd and impoſſible, or only known experimentally to be falſe, as it *cannot* be admitted, the principle muſt be given up; the perſon reaſoned with has no choice left him.

But when the concluſion ſo demonſtrated is neither abſurd nor known experimentally to be falſe, what is to be done? Is the perſon reaſoned with to admit it, and hold faſt the principle? or is he to reject it, and the principle along with it?—For as to the ſuppoſition of denying the concluſion, and yet maintaining the prin-

ciple, without refuting the ſuppoſed demonſtrative reaſoning, I regard it as an abſurdity too groſs to deſerve a moment's attention.

It appears to me, that all ſuch concluſions from a principle, whether firmly believed and aſſerted, or only aſſumed as probable for the ſake of reaſoning, ſhould be admitted as poſſible, and in different caſes as probable or improbable in various degrees, according to many circumſtances of analogy, and perhaps other conſiderations, not eaſily ſpecified, which have ſometimes led men of ſuperior good ſenſe and peculiar ſagacity to very happy anticipations of an unknown reſult. Nor can I conceive any reaſon that a perſon ſhould have for rejecting the neceſſary inferences of a principle which he really believed, when they are pointed out to him, and are neither abſurd, nor known experimentally to be falſe. But I have found experimentally, that all the ſtrictly neceſſary interences which I have drawn from the doctrine of Neceſſity, and which are poſſible, and the correſponding inferences to which, with reſpect

reſpect to phyſical cauſes and effects, are known to be true, are uniformly rejected by thoſe who aſſert the doctrine in queſtion, as ſo manifeſtly falſe that there is no occaſion to put them to the teſt of experiment. Now, from this intuitive knowledge of the falſity of the untried but poſſible conſequences of the principle, I am diſpoſed to infer, that the ſame perſons had a knowledge, though they might chooſe to diſregard or to deny it ſometimes, of the falſity of the principle itſelf. But of this more fully afterwards in its proper place.

Another cenſure, or ſuſpicion at leaſt, to which I ſhould be expoſed, it is proper to guard againſt, by premiſing, that no perſon can be more ſenſible than I am of the impropriety, the folly, the abſurdity, or whatever opprobrious name may be given to it, of applying mathematical reaſoning to moral ſubjects. But I muſt point out two important circumſtances in this particular caſe, which I truſt will not only excuſe but juſtify my attempt.

In the firſt place, I do not apply mathematical reaſoning to prove directly any thing in morals, or any thing relating to mind. I am well convinced that there is ſomething about mind that cannot be meaſured, and to which therefore it would be abſurd to apply mathematical reaſoning. I only apply mathematics to a certain theory of ſome of the operations or phænomena of mind; which theory I mean to diſprove. When it is demonſtrated to be falſe or abſurd, the direct contrary of it, according to a well-known axiom of *logic*, is at the ſame time demonſtrated to be true; and this truth, in the preſent caſe, being ſelf evident, can ſcarce admit of any other kind of proof: nor indeed would it have required any proof at all, as it is very generally acknowledged by mankind, unleſs ſome philoſophers had thought fit to deny it.

In the ſecond place, I conceive that the theory in queſtion fairly admits of the application of mathematical reaſoning directly to itſelf, and of courſe indirectly to the phænomena which it pretends to explain;

plain: for it puts the volitions and actions of men, in relation to motives, on the very ſame footing with the phænomena which occur in the material world, in relation to phyſical cauſes. According to it, motive and action are as conſtantly conjoined as cauſe and effect in phyſics; and this conſtant conjunction, according to Mr HUME's ſyſtem, is all that we know, or, from the nature of things, or at leaſt of our own faculties, ever can know, either of the relation of cauſe and effect, or of that of motive and action; which relations he contends ought therefore to be reckoned one and the ſame. According to Mr HUME's ſyſtem, the motive ſhould be conſidered as the cauſe of the action; not indeed directly, without volition, or in oppoſition to it, but by means of it; the motive firſt influencing the will, and producing volition, and this again producing action. So that, in ſhort, every volition and action may fairly be regarded as an effect, indicating the kind, and meaſuring the degree of its cauſe, as much and as certainly as any change, commonly termed an *Effect*, in inanimate matter. Nor is it of the

ferring mathematical demonſtration to every other form of argument in ſuch a controverſy as this.

As there is no ambiguity in mathematical terms, it is difficult or impoſſible to diſpute or quibble about the import of any propoſition, or argument, or concluſion, which is expreſſed in ſuch terms; and as the fundamental truths or axioms of geometry are well underſtood, and univerſally admitted, it is very difficult, and very unuſual, and I may add very dangerous too, ever to expreſs diſſent or doubt with reſpect to arguments or concluſions that are immediately reſolvable into ſuch axioms.

Men ſo oddly conſtituted by nature, or ſo ſtrangely confounded and bewildered by falſe ſcience, as to doubt, or to pretend to doubt, of the exiſtence of the ground whereon they tread, of the friends with whom they converſe, of the bread which they eat, nay even of their own exiſtence, and who are brought to believe, or at leaſt to maintain, and perhaps to think they ought

ought to believe, that they are conſcious of no more power over their own actions, than what we conceive a weathercock to have over its own motions; and who will aſſert boldly, that they feel themſelves, and that all mankind feel themſelves, irreſiſtibly determined, by a motive which they cannot ſpecify, to give the preference to one of two chances which they know to be perfectly equal; and that they conceive a perſon may reaſonably be praiſed or blamed, nay juſtly rewarded or puniſhed, for doing what he could not *help doing*;—will yet heſitate to admit, that a part may be greater than the whole, or that two things equal ſingly to one and the ſame thing may yet not be equal to one another: Or if any perſon's zeal for a favourite doctrine ſhould tempt him to aſſert or to admit ſuch abſurdities as theſe, it would avail him nothing; for ſuch conduct would inevitably be conſidered, not by the vulgar only, but by philoſophers themſelves, as equivalent to a formal renunciation of all pretenſions either to veracity or to the uſe of reaſon.

But

But even in arguing ſuch a point as that of Liberty and Neceſſity with men of good underſtanding, and of the moſt perfect candour, and it is folly to argue with any others, there is a very important advantage to be gained by the uſe of mathematical reaſoning, eſpecially when diagrams are employed, but to a certain degree, even when algebraical *formulæ* are applied; namely, that the whole chain of reaſoning lies before us at one view; ſo that if there be the ſmalleſt error or imperfection in any part of it, it muſt inſtantly be diſcovered, and when diſcovered, there can be no diſpute about it. Every ſuſpicion or doubt that can ariſe may in a moment be either removed, or changed into perfect certainty. It is ſcarce poſſible that a perſon reaſoning in ſuch a way ſhould deceive himſelf; and it is abſolutely impoſſible that he ſhould deceive or miſlead others, who underſtand the nature of mathematical reaſoning.

Such is the kind, and ſuch are the acknowledged and long-experienced advantages, of the *inſtrument* which I employ to

aſſiſt me in the inveſtigation which I have undertaken. If my rule and compaſſes (to uſe BACON's favourite illuſtration) are bad of their kind, or if I have through accident or ignorance (for I am ſure it has not been with deſign) miſapplied them; if I have included in my *meaſurement* any thing which I ought not to have included, or have omitted any thing which I ſhould have taken in, or have erred in ſtating the *account*, which I have endeavoured to make up with the greateſt preciſion, I muſt anſwer for it; and I ſhall chearfully acknowledge my error whenever it is pointed out to me, and my obligations to the perſon who ſhall ſet me right: but then, neither candour requires, nor reaſon permits me to liſten to any other kind of arguments or objections that *can* be urged againſt my work. Such is the undiſputed prerogative of mathematical reaſoning; it is not only of much higher authority in every caſe to which it can be fairly applied, than the unaſſiſted judgement of the wiſeſt of men, but it is of higher authority than any other aſſiſtance to human underſtanding that has yet been contri-

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ved; and no prejudices, no opinions, no authorities, no reaſonings, can without abſurdity be oppoſed to it. When I have conducted it with caution, and reviſed it with care, and ſubmitted it to the review of many different perſons who are well qualified to judge of it, and am ſtill ready to liſten to every objection that can be urged, either againſt the principles aſſumed, or the ſeveral ſteps of the reaſoning employed, I have done all, not only that I ought to do, but that I can do, to be aſſured that my concluſion is right. I have at leaſt taken it out of the hands both of the vulgar and of metaphyſicians, who ſeem to diſtruſt one another, and put it into the hands of mathematicians, whom both parties reſpect, and can have no reaſon to diſtruſt. If any perſon ſhall notwithſtanding endeavour to argue againſt it on other principles, and by a different form of reaſoning, he can deſerve no more attention or regard than one, who, without denying the axioms of geometry, or pointing out any defect in the reaſonings of mathematicians, ſhould write a huge book, or pronounce a very ſpirited Phi-

lippic, to prove that the three angles of a plain triangle are not equal to two right angles. Any thing demonſtrated mathematically, againſt which no proper mathematical objections can be made, whatever elſe may be ſaid againſt it, neither requires nor can well admit of any additional ſupport or vindication: Indeed to argue for it is as great an abſurdity as to argue againſt it.

This ſupreme prerogative of mathematical reaſoning, is, I believe, undiſputed among men of ſcience; ſeveral of whom have been at pains to point out the various circumſtances in which the ſuperiority of mathematical over every other kind of reaſoning chiefly conſiſts. The beſt obſervations on this ſubject that I have ever ſeen, are thoſe of Dr BARROW, in his *Lectiones Mathematicæ*; of Monſ. D'ALEMBERT, in his *Elemens de Philoſophie*, and *Diſcours preliminaire de l'Encyclopedie*; and of Dr REID, in his Eſſay on Quantity, publiſhed in the 45th volume of the Philoſophical Tranſactions.

If

If it be not impoſſible, it is at leaſt needleſs, to add any thing to what theſe authors have ſaid on this ſubject: but though nothing can be wanting to confirm the confidence which men of ſcience place in mathematical reaſoning; yet I think it may be worth while to point out a few of the moſt important and generally acknowledged advantages of it, in order to ſhew that they have all been kept in view, and, as I truſt, fully attained, in this Eſſay.

Diagrams and algebraical *formulæ*, tho' much uſed, and with great advantage, in mathematical reaſoning, are evidently not eſſential to it, nor to the moſt perfect demonſtration. We have demonſtration without diagrams, when *formulæ* are employed, as in algebra; without *formulæ*, when diagrams are uſed, as in the ancient geometry: whence it follows, that demonſtration depends on ſomething that is in common to both thoſe modes of reaſoning: and we have mathematical demonſtration in many caſes, as in reaſoning about proportionals, and, if our powers

powers of apprehenſion and comprehenſion were greater, might have it in many more caſes, without either *formulæ* or diagrams.

Some of the uſes of both theſe aſſiſtances to mathematical reaſoning have been already pointed out, and need not be repeated. But they have ſtill greater advantages. Both of them, eſpecially diagrams, and to a certain degree even algebraical *formulæ*, with men who are much uſed to them, aſſiſt very greatly the *apprehenſion*, or, as we often call it, the imagination. They enable us to conceive and underſtand, more eaſily and more clearly than otherwiſe we could do, the various things and relations about which we are to reaſon. The diagrams, in particular, may be regarded as a kind of illuſtrations or rude examples of the truths to be demonſtrated. Hence a good *conſtruction* is often ſufficient to enable either the author, or any other perſon of competent knowledge, to make out the demonſtration of a propoſition, without the help of words; and both diagrams and *formulæ* contribute much to aſſiſt *comprehenſion*;

henſion; that is, as it appears to me, the ſimultaneous conception of a great number or maſs of co-exiſtent thoughts; and at leaſt the immeaſurably quick conception of a train of thoughts in ſucceſſion, ſuch as occur in numberleſs propoſitions, that involve many things, relations, and conditions. Grammatical language, whether ſpoken or written, as being only a ſucceſſion of audible or viſible ſigns of thoughts arranged in a certain artificial order of time and place, both from its ſlowneſs, and from the nature of its arrangement, is a very inadequate expreſſion, either of the wonderfully quick or the variouſly combined operations of thought which it is employed to denote; many of which ſtand related to one another in ways very different from any *poſſible* arrangement in time and place. To theſe natural relations all ſucceſſions of words do ſome kind of violence; the inflections of words, ſuch as are found to a certain degree in all languages, and to a very great degree in the more perfect ancient languages, do ſome kind of juſtice to them; but diagrams and *formulæ* approach

proach much nearer to a juſt expreſſion of the combination, or very quick ſucceſſion of thoughts which they are employed to denote or illuſtrate, than either the arrangement or the inflection of common words. A proper diagram will ſuggeſt almoſt inſtantaneouſly, not only the propoſition, but the demonſtration of an important and complicated theorem. And though algebraical notation or *formulæ* have not preciſely this advantage; yet they come ſo near to it, that by means of them mathematicians can fully and diſtinctly expreſs in one line theorems ſo complicated, that the enunciation of them in grammatical language would require many pages; which would never anſwer the purpoſe; for long before the reader or hearer could arrive at the end of the propoſition, the firſt part of it, or rather the thoughts expreſſed by the firſt words of it, would be gone, not to be recalled without a painful effort, and ſcarce to be retained ſo as to be united with, or conceived along with the thoughts denoted by the laſt words of it; without which the propoſition, as, for example, a certain relation

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predicated of the ſubjects of reaſoning, cannot properly be ſaid to be conceived at all. And this inconvenience being repeated at every ſtep of perhaps a very long demonſtration, muſt ſoon become quite intolerable.

To this it may be added, that both diagrams and algebraical *formulæ* are neceſſarily free from that ambiguity ariſing from the various meanings of the words of common language, which has ſo often confounded the reaſonings and fruſtrated the labours of men of genius who employed it careleſsly in ſcientific reſearches.

On account of theſe advantages, not as having any kind of authority, nor yet as being eſſential to perfect demonſtration, algebraical *formulæ* and diagrams are occaſionally employed in this Eſſay.

Another important advantage of mathematical reaſoning, and which I conceive to be eſſential to it, and in a manner characteriſtic of it, is, that it relates to quantity. Now, the notions of quantity, in

the moſt comprehenſive ſenſe of this term, and of its different *genera* and *ſpecies*, and of the various relations of quantity, ſuch as equal, greater, leſs, proportion, addition, ſubtraction, &c. are ſo preciſe, and ſo familiar to us, that there is peculiar perſpicuity, and in general facility too, in all reaſonings which depend upon them; and the ultimate truths concerning them have long ſince been reduced to the form of axioms, and univerſally acknowledged as ſuch.

" Quantity is that which may be meaſured. Whatever is meaſurable muſt be made up of parts, which bear proportion to one another, and to the whole; ſo that it may be increaſed by addition of like parts, and diminiſhed by ſubtraction, may be multiplied and divided, and, in a word, may bear any proportion to another quantity of the ſame kind, that one line or number can bear to another.

There are ſome quantities which may be called *proper*, and others *improper*. That may be called *proper* quantity which

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is meaſured by its own kind, or which of its own nature is capable of being doubled or tripled, without taking in any quantity of a different kind as a meaſure of it. Thus a line is meaſured by known lines, as inches, feet, or miles; and the length of a foot being known, there can be no queſtion about the length of two feet, or of any part or multiple of a foot. And this known length, by being multiplied or divided, is ſufficient to give us a diſtinct idea of any length whatſoever.

Improper quantity is that which cannot be meaſured by its own kind; but to which we aſſign a meaſure by means of ſome proper quantity that is related to it. Thus, velocity of motion, when we conſider it by itſelf, cannot be meaſured. We may perceive one body to move faſter, another ſlower; but we can have no diſtinct idea of a proportion between their velocities, without taking in ſome quantity of another kind to meaſure them by. Having therefore obſerved, that by a greater velocity a greater ſpace is paſſed over in the ſame time, by a leſs velocity a leſs ſpace, and by an equal velocity an equal

improper quantity may in time be introduced into mathematics, or to what new ſubjects meaſures may be applied; but we may conclude, that there is no foundation in nature for, nor can any valuable end be ſerved by, applying meaſure to any thing but what has theſe two properties: Firſt, it muſt admit of degrees of greater and leſs; ſecondly, it muſt be aſſociated with or related to ſomething that has proper quantity, ſo as that when one is increaſed the other is increaſed, when one is diminiſhed the other is diminiſhed alſo; and every degree of the one muſt have a determinate magnitude or quantity of the other correſponding to it."

Theſe paragraphs are quoted almoſt *verbatim* (with only a little abridgement) from Dr REID's paper already mentioned. That paper was written with the expreſs purpoſe of ſhewing that mathematical reaſoning was not applicable to moral ſubjects. It muſt be conſidered, therefore, as the moſt unfavourable in its principle to my deſign. Yet even according to the two requiſites mentioned in the laſt paragraph,

graph, it muſt be evident, that if the motives of men be aſſociated with or related to their actions, in the way that is aſſerted by Mr HUME, and the other advocates for the doctrine of Neceſſity, they may be meaſured with a certain degree of preciſion by the actions proceeding from or conſtantly conjoined with them; eſpecially ſuch actions as ſtand related to things that have proper quantity. It is thus that we meaſure, and are thereby enabled to apply mathematical reaſoning to, forces or cauſes of motion; of which cauſes we know nothing (as Dr REID himſelf acknowledges) but by their effects, namely, motion, with which they are duly aſſociated or related, and motion again being duly related to extenſion and duration, which are proper quantities, both the motion and the force (or cauſe of the motion) become meaſurable.

In like manner, we may meaſure the ſtrength of an acid or an alkali by their relation to the oppoſite ſalt; and knowing how much, that is, how many grains or pounds of the one are required to ſaturate

a given quantity or number of grains or pounds of the other.

If the general nature of the reaſoning that I employ be conſidered, which is direct with reſpect to phyſical cauſes and effects, but indirect, or *ad abſurdum*, with reſpect to motives and actions, it will not be thought any objection to my plan, that neither motives nor the force of motives are really quantities or ſubjects of mathematical reaſoning. I mean to prove, that they are *not* quantities, which, according to the doctrine of Neceſſity, they would be, and for this purpoſe aſſume the ſuppoſition, that they are what they have been thought, and from this ſuppoſition draw neceſſary inferences which are abſurd.

I ſhould beg leave to add, by way of commentary on Dr REID's Obſervations on Quantity, and the manner in which improper quantities are to be meaſured, that ſome of them are ſo imperfectly known to us, that they cannot be fully meaſured, nor accurately compared together,

as the degree of ſenſation from any given degree of heat varies greatly, according to many circumſtances, both mental and corporeal, of the ſentient being. The effect of heat beſt adapted to ſerve as a meaſure of it, and accordingly employed almoſt univerſally for this purpoſe, is the expanſion (or in ſome caſes, as in Mr Wedgwood's clay-thermometer, the contraction) which it produces. This effect is conſtantly conjoined with it; it has an infinite number of degrees, eaſily perceivable by us, and correſponding to the intenſity of the heat; and expanſion or contraction, as being modifications of extenſion, have *proper* quantity, or are meaſurable by their own parts.

Yet, with all theſe advantages, it is evident, that expanſion and contraction afford but an imperfect meaſure of heat, and that we have but an imperfect knowledge of the quantity of heat in any body, and of the proportion which one degree of heat bears to another. We know not the beginning of the ſcale of heat, or that ſtate of a body which bears the ſame rela-

tion to heat that reſt bears to motion, or the cypher [0] to an arithmetical number. We cannot, therefore, ſay with propriety, that one degree of heat is twice or thrice as great as another degree of it: for example, that melting iron is twice or thrice as hot as melting ice.

This, however, by no means prevents us from applying mathematical reaſoning to the ſubject of heat, either as to abſolute quantity or as to temperature. It only precludes any reference to thoſe mathematical axioms that involve the notions of multiplication and diviſion. But all reaſonings that require a reference to thoſe axioms which involve only the notions of equal, greater, leſs, addition, and ſubtraction, will ſtill be valid. If to equal temperatures equal additions of temperature be made, the ſums of temperature will be equal: if unequal additions or ſubtractions be made to or from equal temperatures, or equal quantities of heat, the ſums or the remainders of temperature or quantities of heat will be unequal.

In

In like manner, we may fairly refer to the ſame kind of axioms in reaſoning concerning the ſuppoſed force of motives in producing action, if they admit only of the relations of equal, greater, leſs, addition or increaſe, ſubtraction or diminution, even although we cannot meaſure exactly the proportion which the force of one motive bears to that of another, nor ſay with any propriety, that one of them is half as ſtrong, or three times as ſtrong, as another. We cannot doubt, that a poor labourer's deſire to earn a ſhilling is equal to his deſire to earn a ſhilling, and greater than his deſire of earning ſixpence, and leſs than his deſire of earning a crown: yet it would be raſh, and perhaps wrong, to ſay that his deſire of earning a ſhilling was double his deſire of earning ſixpence, and only the fifth part of his deſire to earn a crown. We are ſure likewiſe, that walking a mile is more in point of action than walking an hundred yards on the ſame kind of road; and that working for one day is much leſs than working in the ſame way for a week. Now, it is in conſequence of theſe obvious rela-

tions of motives and actions reſpectively, and to one another, and of actions to things having proper quantity, ſuch as extenſion and duration, without ſeeking to know their exact proportions, or the loweſt poſſible degrees of our appetites, paſſions, deſires, &c. that I conceive they may be regarded as ſpecies of quantity, and fit ſubjects of mathematical reaſoning.

But the chief advantage of mathematical demonſtration, and what independently of all other conſiderations, gives it an infinite ſuperiority over all other kinds of reaſoning and evidence, and makes it of the higheſt poſſible or conceivable authority in ſcience, is, that it conſiſts entirely of an uninterrupted ſeries or chain of neceſſary truths; every one of which we clearly apprehend, not merely as a ſimple matter of fact, which is, or was, or is to be, though it might have been otherwiſe, at other times, or in other circumſtances; but as ſomething immutable and eternal, independent of all times and circumſtances, which ever *muſt be*, the contrary of it,

or

or any thing inconſiſtent with it, being as clearly apprehended to be abſurd and impoſſible.

This is what Monſ. D'ALEMBERT terms "*La liaiſon de deux idees*," and "*L'enchaine-*"*ment que les Geometres ſavent mettre entre*"*les verites.*"

BARROW's notion of it, though expreſſed in different words, is preciſely the ſame with D'ALEMBERT's: *Mihi videtur, quod omnis diſcurſus certus ac evidens, juxta logicæ regulas irrefragabiles, fluens ex principiis univerſaliter et perpetuo veris, adeoque in quo neceſſaria terminorum connexio reperitur, eſt propriiſſime, potiſſime, ſcientificentiſſimeque demonſtratio.*——*Quodque demonſtrationes (quanquam aliæ aliis brevitate, concinnitate, proximitate verſus prima principia, et ſimilibus præcellant virtutibus) evidentia ſaltem, certitudine, neceſſitate, terminorum eſſentiali connexione, et dependentia mutua, ſibi cunctæ pares ſint; denique quod mathematica ratiocinia ſint perfectiſſimæ demonſtrationes.*

The notions of Quantity, and of its various

rious genera, ſpecies, and relations, are peculiarly fit to be the ſubjects of ſuch ſtrict demonſtrative reaſoning; as, from their ſimplicity, preciſion, and perſpicuity, many neceſſary relations among them are more eaſily perceived than among almoſt any other things. The moſt general and obvious of theſe have been expreſſed, and univerſally admitted as axioms. But it muſt be obſerved, that no inference can be drawn merely from the axioms taken by themſelves, nor any progreſs made in mathematical ſcience, without aſſuming certain hypotheſes, or ſuppoſitions of things poſſible, or at leaſt diſtinctly conceivable. Theſe are expreſſed by accurate definitions, which bear a certain relation to what are termed the *Poſtulata* of geometry, or acknowledgements that certain things may be done, or at leaſt may be conceived to be done. Accordingly all the demonſtrations of geometry cannot prove one ſimple matter of fact; not even that the quantity A is equal to the quantity C. But if it be aſſumed, that A is equal to B, and that B is equal to C, then we ſhould have complete demonſtration, that A *muſt*

be

be equal to C. Every theorem in geometry might be fairly ſtated in a way correſponding to this example: "*If there were* a right angled plain triangle, the ſquare of the hypothenuſe *muſt be* equal to the ſum of the ſquares of the other two ſides of it." And the demonſtration of every propoſition in geometry may be reſolved into a chain of perfect ſyllogiſms, ultimately depending on the axioms and on the definitions. Now, in every perfect ſyllogiſm, the neceſſity of the concluſion, as following from the premiſes, is apprehended as clearly and intuitively as the neceſſity of any axiom in geometry. It has been ſaid, and I believe with reaſon, that a man who could admit the major and minor of a juſt ſyllogiſm, and yet *bona fide* deny the concluſion of it, would be a greater monſter than a man with two heads. The ſame may be ſaid of one who *bona fide* denied a geometrical axiom. It is even implied in the notions of logic, of a juſt ſyllogiſm, of demonſtration, that no ſuch monſter ever did or ever can exiſt. And this uniform concurrence and acquieſcence of all men of ſound judgement

kind of evidence, or one more ſtrictly ſcientific.

I muſt add, that, as it is not among quantities alone that we are capable of perceiving neceſſary relations, there may be axioms, or ſelf-evident neceſſary truths, and ſtrict demonſtration of truths not ſelf-evident, on other ſubjects beſides mathematics. In this Eſſay I have occaſion to give ſome ſpecimens of ſuch axioms and demonſtrations with reſpect to the notion of the conſtant conjunction of cauſe and effect. Indeed theſe axioms have been tacitly aſſumed, and admitted, even by mathematicians, in their reaſonings in phyſics; juſt as the axioms of geometry, (according to an important obſervation of D'ALEMBERT), though they had never been expreſſed formally and ſeparately, would uniformly have been admitted by all mankind, in every piece of reaſoning wherein there was occaſion to refer to them.

If the principles which I aſſume as axioms are ſelf-evident neceſſary truths, and

if the neceſſity of the connection at every ſtep of the very ſhort ſeries of reaſoning that I employ be intuitively evident, and if the various conſequences drawn from the principles by that reaſoning be either intuitively or experimentally abſurd or falſe, my argument is the demonſtration which I take it for. Nor can the ultimate concluſion, which I conceive to be demonſtrated, be denied by any candid or intelligent reaſoner, unleſs he can ſhow, that either ſome of the ultimate principles aſſumed as axioms, or ſome of the ſteps of the deduction from them, are erroneous.

SECT. IV.

Reaſons for not attempting to give ſtrict definitions of the terms employed in this Eſſay.—Sentiments of BACON *on this ſubject.—Means of ſupplying the want of definitions on certain ſubjects.—Obſervations on the meaning of ſome of the terms employed.—Juſtneſs of* ARISTOTLE's *definition of the final Cauſe or Motive;—phyſical Cauſe;—Conſtant Conjunction;—Power;—Want of Power, or* Inertia *of Mind;—Mind;—Body.*

WHatever may be thought of the advantages or the indiſpenſable neceſſity of definitions of the terms employed in many ſcientific reſearches, it will, I preſume, be acknowledged at once by every perſon of competent judgement and candour, that in certain caſes good definitions cannot be given; and that of many terms no definitions are needed,

even for the purpoſe of the ſtricteſt reaſoning.

No ſimple notion admits of being defined; nor can the term employed to expreſs it be explained any other way than by other ſynonymous words or phraſes, or by the uniform uſe and application of the term to the thing or notion denoted by it. And if the thing or notion be well, and of courſe uniformly conceived by mankind, whether it be ſimple or compound, and if the term expreſſing it be familiarly uſed in common, or even in ſcientific language, and applied only to its proper object, it can ſcarce admit of, and ſurely cannot need, any explanation or definition. Who, for example, would think it neceſſary, with a view to any reaſonings, to define exiſtence or thought, time or ſpace, a man or a woman, a houſe or a church? If we would acquire more accurate notions, or more perfect knowledge of thoſe and numberleſs other things than mankind generally have, we muſt examine the objects themſelves, not attempt to reaſon from definitions of them; and

and we ſhall infallibly be directed to the proper objects that we wiſh to examine, both by the general imperfect notions we have of them, and by the uniform application of the terms expreſſing them.

The uſeleſſneſs of definitions in many caſes, and the impoſſibility of giving them in others, and the proper means of ſupplying the want of them, and the folly of attempting to acquire juſt notions, or to make any progreſs in natural ſcience, merely by arbitrary definitions, or by any other means than accurate examination of the objects to which our notions relate, was clearly perceived and well pointed out by BACON.

Syllogiſmus ex propoſitionibus conſtat, propoſitiones ex verbis, verba notionum teſſeræ ſunt. Itaque, ſi notiones ipſæ, (id quod baſis rei eſt), confuſæ ſint et temere a rebus abſtractæ, nihil in iis quæ ſuperſtruuntur, eſt firmitudinis. Itaque ſpes eſt una in inductione vera.

NOV. ORG. 14.

Verba

Verba autem plerumque ex captu vulgi imduntur, atque per lineas vulgari intellectui maxime conſpicuas res ſecant. Quum autem intellectus acutior aut obſervatio diligentior eas lineas transferre velit, ut illæ ſint magis ſecundum naturam, verba obſtrepunt. Unde fit ut magnæ et ſolennes diſputationes hominum doctorum ſæpe in controverſias circa verba et nomina deſinant; a quibus (ex more et prudentia mathematicorum) incipere conſultius foret, eaſque per definitiones in ordinem redigere. Quæ tamen definitiones in naturalibus et materiatis huic malo mederi non poſſunt; quoniam et ipſæ definitiones ex verbis conſtant, et verba gignant verba: adeo ut neceſſe ſit ad inſtantias particulares, earumque ſeries et ordines recurrere.

NOV. ORG. 59.

Theſe obſervations of BACON perhaps would need, and ſurely would deſerve, a formal and ample commentary; and ſuch a one I may probably have occaſion to beſtow on them on another occaſion. Even this Eſſay may be regarded as a ſort of practical commentary on them, at leaſt as an application of the neceſſary precept,

Ad

Ad inſtantias particulares, earumque ſeries et ordines recurrere, inſtead of offering or adopting definitions, in order to acquire juſt notions of the objects of my inveſtigation. Theſe are all natural, familiar, and I believe univerſal and uniform, notions among mankind; but they have unluckily, in conſequence of various circumſtances, been in a great meaſure confounded with one another, and require to have their differences aſcertained and pointed out; as, for inſtance, between motive and phyſical cauſe. This being the object of my Eſſay, it would be little leſs than an abſurdity, and a contradiction in terms, and certainly would be a complete begging of the queſtion, to begin by giving definitions of thoſe two notions and relations. Good definitions of them muſt expreſs their generic nature, and their ſpecific differences; that which is in common to them both, and that which is peculiar to each of them. Now, this is the very point in diſpute; and one of the moſt important circumſtances of difference between them, the reference of motives to a ſelf-governing power in living perſons, is denied to take

place,

place, or even to be poſſible. And this point evidently cannot be ſettled by any definition, but only by careful examination; the reſult of which may be a good definition, if ſuch a one ſhould be needed.

But though definitions of them cannot be given, and are not wanted, ſome obſervations on the meaning and application of the principal terms employed in this Eſſay may be uſeful in various ways.

With reſpect to the term *Motive*, it does not appear that there has ever been any ambiguity or miſapplication of it, as there has ſo often been of the term *Cauſe*, which has been employed in various meanings; ſome of them generic and comprehenſive, others of them ſpecific and limited, and one of them ſynonymous with *Motive*.

Thus we may ſay without impropriety, that a porter's deſire to earn a ſhilling was the *cauſe* of his going a mile; juſt as we ſay, that the impulſe of the wind on the ſails of a ſhip is the *cauſe* of her progreſs

greſs through the water. But the meaning of the word *Cauſe* is widely different in theſe two caſes. In the former it is ſynonymous with *Motive*; but not ſo in the latter. We might ſay very properly, that the deſire of earning the money was the porter's *motive* for going; but not that the impulſe of the wind was the ſhip's motive for advancing through the water.

So well is this underſtood by mankind in general, that even when the ſame thing, as for example an emotion or paſſion, is the *phyſical cauſe* of ſome events or effects, and the *motive* of other events or actions, theſe two relations are never confounded in diſcourſe by any miſapplication of the term *Motive*. We ſhould never ſay, that fear was a perſon's *motive* for trembling or growing pale; but we ſhould ſay it was his motive for running away on an occaſion of danger. A perſon, from violent anger, may grow red, may have a diminution of ſome ſecretions, as of thoſe in the mouth; an increaſe of others, as of the bile; and a vitiated ſtate of others,

as of the milk, in a nurſe; or may have a great and ſudden increaſe of muſcular ſtrength, may have the circulation of the blood and the reſpiration much diſordered; may fall into convulſions or apoplexy, or may die ſuddenly. All theſe are regarded as *effects*, and referred to the paſſion Anger as their *cauſe*.

The ſame perſon, from the ſame paſſion, may beat or kill thoſe who were the objects of it. Theſe are regarded as *actions*, and referred to anger as the *motive* of them.

SHAKESPEARE tells us, that "ſome have died for love, and ſome run mad, and ſome with deſperate hands themſelves have ſlain." Dying or running mad are conceived to be *effects*, referable to love as their *cauſe*; killing themſelves, an *action* referred to love (or, more ſtrictly, to the deſire of ending the miſery they felt from unhappy love) as the *motive* of it.

I believe, therefore, it will be found, that any thing uſually termed a *motive* may,

may, without danger of confuſion or error, be taken as an example to be examined and compared with any proper example of a *phyſical cauſe*.

From conſidering the examples of motive and action, it appears that there is one obvious and important circumſtance in all of them, which is not found in any of thoſe of phyſical cauſe and effect, namely, the intervention of the perſon's will, choice, or determination, between the motive and the action. For reaſons formerly mentioned, I do not regard this as the only difference between the two relations in queſtion, nor admit even the relation between the motive and the volition or determination to be the ſame with that between a phyſical cauſe and its effect; but I conceive that this ſimple and obvious circumſtance may with propriety be attended to in the mean time. It will ſerve almoſt as well as a definition to enable us, in caſe of need, (which I can hardly ſuppoſe), to diſtinguiſh the one relation from the other, till by more accurate obſervation and induction the fur-

ther differences between them, if any ſuch there are, can be fully aſcertained.

But though definitions in the preſent caſe would be both uſeleſs and improper, there is ſo much merit in ARISTOTLE's definition of a motive or final cauſe, and ſuch a uſe may be made of it, that it is worth while to take notice of it. He defines the fourth of his cauſes, which is the one at preſent in queſtion: Το ου ενεκα, και το αγαθον. Theſe are indeed but imperfect ſentences or innuendos; but they are perfectly intelligible, and in one reſpect better than complete ſentences or propoſitions would have been. The prepoſition ενεκα has, I conceive, a generic meaning, in common with all other prepoſitions, namely, *relation*; and a ſpecific meaning peculiar to itſelf, namely, that particular kind of relation, which may be expreſſed (though not perhaps excluſively) in Latin by *ob* or *propter*, and in Engliſh by *for*, or leſs ambiguouſly, (as *for* has many meanings), by the phraſes, *for the ſake of*, *on account of*, *in conſideration of*, *with a view to*, and many others. This is

is fully confirmed by ARISTOTLE's ſecond innuendo, και το αγαθον, and well illuſtrated by the example he gives of making a ſtatue to be placed in a temple from ſome religious conſideration.

Now, it appears to me a curious, and even an important conſideration, that thoſe very philoſophers who have moſt keenly aſſerted the doctrine of Neceſſity as conſiſting in the perfect identity of the relation of motive and action with that of phyſical cauſe and effect, and who have moſt poſitively denied the reality, and even the poſſibility, of any ſelf-determining power in a perſon, independently of the abſolute and irreſiſtible force of motives, have never, in point of thought, deviated in the leaſt from the common notion of motive; " that for the ſake of which:" Now, this notion always implies and refers to ſuch a power in the agent, exerted in the common caſes of voluntary actions proceeding from motives of moderate intenſity, and overcome in the rarer caſes of compulſion from motives of extreme violence, as, for example, fear or torture,

torture, which ordinary perſons cannot reſiſt. Even thoſe who have expreſsly aſſerted the point of conſtant conjunction as taking place equally in both relations, ſeem only to have believed it to take place in that of cauſe and effect in phyſics, but have never ſuppoſed it in that of motive and action. I conceive that ſuch philoſophers have been only perplexed by the vague and ambiguous terms which they employed in their reaſonings, and by the ſuperficial careleſs view which they have taken of thoſe caſes in which the apparent reſult is the ſame, according to the relation of "that for the ſake of which," and that expreſſed by the terms *Phyſical Cauſe* and *Effect*, which is undefined, but which is conceived to involve the circumſtance of conſtant conjunction of the cauſe with its effect, as well as thoſe of priority of the cauſe, and relation to event; which two laſt circumſtances are common to both relations. I find no reaſon to think that they ever have been deceived; but, on the contrary, every reaſon to believe that they never have been deceived, in point of thought, with reſpect to the relation of motive,

motive, however ſadly they may have been confounded, and whatever ſtrange concluſions they have been led to aſſert, or to admit, with reſpect to it, by the vague terms they employed in their reaſonings.

This I conceive may be juſtly inferred from the following conſiderations. It is eaſy to ſpecify caſes or inſtances in which the reſult of the two relations in queſtion is different; and particularly in which the moſt obviouſly neceſſary inferences from the undefined, but well underſtood notion of phyſical cauſe, or from the more definite principle of conſtant conjunction, lead to a plain viſible reſult, perfectly inconſiſtent with that to be expected from the principle of "that for the ſake of which." Now, when various neceſſary inferences are drawn from the principle of conſtant conjunction, with reſpect both to actions and to effects; if the inferences reſpecting actions are of ſuch a nature as neither to require nor to admit of any appeal to conſciouſneſs, or to a perſon's teſtimony with regard to his own thoughts, but

but are to be judged of by open experiment and obſervation; juſt as the inferences reſpecting phyſical effects commonly muſt be; and ſuch inferences are propoſed to thoſe who aſſert the doctrine of the neceſſity of human actions as conſiſting in the perfect ſameneſs of the relation of motive and action with that of cauſe and effect in phyſics, and particularly who maintain, that the circumſtance of conſtant conjunction of cauſe with effect, motive with action, takes place equally in both relations; the conſequence in all the trials that I have made has been *invariably* as follows.

1. All ſuch inferences with reſpect to phyſical cauſes and their effects are univerſally and at once admitted; and when put to the proper teſt, are found experimentally true.

2. All ſuch inferences with reſpect to motives and actions are univerſally and at once admitted in all caſes in which the apparent reſult is the ſame, both according to the relation of conſtant conjunction

tion and that of the vulgar notion of motive, "that for the ſake of which;" and theſe inferences are alſo found true upon trial univerſally.

3. All ſuch inferences with reſpect to motives and actions are rejected or denied univerſally and at once; that is, without either putting them to the teſt of experiment, or pointing out any error in the reaſoning that leads to them, in all caſes wherein the reſult is different according to the two relations in queſtion; the inferences in ſuch caſes, though perfectly new, and not merely untried, but unthought of before, ſeem to be known intuitively to be falſe as matters of fact; and this equally by thoſe who maintain the doctrine of Neceſſity and by the vulgar; by thoſe who aſſert and by thoſe who deny thoſe principles of which they are, or at leaſt at firſt ſight appear to be, ſtrictly neceſſary conſequences. The inferences of this kind relating to motives and actions, I own, I have not put to the teſt of experiment; nor have I as yet met with

any perſon who thought it neceſſary, or even wiſe, to do ſo.

Theſe facts ſhew, in the firſt place, that the mode of reaſoning employed, and the inferences propoſed as the reſult of it, are intelligible; for if they were not underſtood, they could not rationally be either admitted or rejected. In the ſecond place, they ſhew that the reaſonings are at leaſt plauſible; elſe in ſome one or more of ſo many caſes, ſome fallacy in them would have been diſcovered. In the third place, they render it probable in a degree approaching very nearly to certainty, that the aſſumed principle of conſtant conjunction, of which ſo many (ſeemingly) neceſſary inferences are true as matters of fact in caſes of phyſical cauſe and effect, is, with reſpect to them, a juſt principle, and makes a part of that relation. In the fourth place, they ſhew, with abſolute certainty, that the ſame principle of conſtant conjunction is a falſe one with reſpect to motive and action, and makes no part of that relation. In the fifth and laſt place, they ſhew plainly, with reſpect to all

all on whom the trial has been made, that though they had confounded the two relations completely in their words and reaſonings, yet, in point of ſimple thought or notion, they had diſtinguiſhed them perfectly; and whenever caſes requiring the diſtinction to be made occurred, or were propoſed to them, knew well how to make it; and accordingly, in all ſuch caſes, admitted, with the moſt unerring preciſion, only thoſe reaſonings, and thoſe concluſions, which were juſt inferences from the two different notions reſpectively; which notions they were moſt eagerly endeavouring to confound, and perhaps flattered themſelves they had confounded for ever.

Theſe obſervations, I think, go near to prove, that this natural and common notion of the relation of motive and action is almoſt or altogether indefeaſible, like ſeveral other natural notions which many philoſophers have in vain endeavoured to get rid of; ſince the moſt deliberate and perſevering efforts, made with every aſſiſtance that plauſible reaſoning, and ambi-

guous words, and even ſuperior talents and acuteneſs, could furniſh, have been employed in vain to ſubvert it. And it is on this principle alone that I conceive the ſingular phænomenon can be accounted for, of men of ſcience aſſerting a principle, and yet denying its apparent neceſſary conſequences, without a trial, although they are poſſible; and without ſhewing, or attempting to ſhew, that the reaſoning which led to them was erroneous *.

They likewiſe prove, that the account or definition of it given by ARISTOTLE is very nearly juſt; though perhaps an ingenious man, who ſhould chuſe to employ himſelf ſo idly, might find means to cavil at it in a plauſible manner. *Si ſic omnia dixiſſet*, had all his definitions, or even thoſe only which related to cauſes, been of this kind, it would have been well for ſcience, and would probably have ſaved philoſophers the fruitleſs labour of treading over and over the mazes of an end-

* Vide p. 82. & 83.

leſs

leſs labyrinth, into which he led them merely by one or two arbitrary and bad definitions, and a needleſs perverſion of common language.

The circumſtance, already taken notice of, that ARISTOTLE's definition of a final cauſe or motive conſiſts only of innuendoes, not perfect propoſitions, I conceive to be an advantage in it. Perhaps they might be completed, in an unexceptionable manner, ſomewhat in this way: "That for the ſake of which perſons uſually act,"—"the good propoſed to be attained by acting." But were we to complete them in a more careleſs, but more obvious way, "that for the ſake of which perſons act," "the good attained by acting," the definition would be erroneous, and much too limited, and would lead to a very idle controverſy, Whether any appetite, paſſion, deſire, or other principle of action, uſually termed a *Motive*, ſhould be called ſuch at all times, or only when action proceeded from it? But the philoſophical queſtion is not, What ſuch principles of action ſhall be called? but, What is the relation between

between them and our actions? and, Is it the ſame with that of phyſical cauſe and effect?

With reſpect to the term *Cauſe*, from what has already been ſaid of the various meanings, both general and particular, in which it has often been employed, and of the various principles of change to which events may be referred, the nature and differences of which have never been duly inveſtigated, it will be evident, that it muſt be very difficult, if indeed it be poſſible, to give an unexceptionable explanation of it, ſuch as ſhall completely diſtinguiſh the notion expreſſed by it, not only from that of motive, but from that of agent, of occaſion, of inſtrument, of evidence, and many others. Nor ſhall I attempt ſuch a taſk, but truſt that the generic nature of the notion of *phyſical cauſe*, or that which is in common in all the examples of it, however difficult it may be to expreſs it in words, will be underſtood from an examination of the various inſtances that are to be given of it, and compared with thoſe of *motive*. One of the

moſt

moſt obvious circumſtances of it, and which, for many reaſons, it is of peculiar conſequence to attend to, is its *conſtant conjunction* with *effect*, that is, with *event* coming after it.

The meaning of the phraſe *Conſtant conjunction* has already been explained, p. 28. 29. 30. But ſome further elucidations of it may be requiſite.

The uſual proper event or effect conſtantly conjoined with a cauſe, or at leaſt conceived to be ſo, cannot in all caſes be obſerved pure, as many different cauſes, having effects either of the ſame kind or of different kinds, may be applied to the ſame ſubject at the ſame time. Effects of the ſame kind muſt interfere with one another, or be mixed and blended together, in one of three different ways: Either directly concurring, and being added together; or directly counteracting and oppoſing one another; or being indirectly combined, ſo as neither completely to concur, nor completely to oppoſe one another.

Thus,

by reaſon of their minuteneſs, may eſcape our obſervation; for example, the gravitation of a pendulum to the body of the perſon who holds it in his hand, or ſtands near it, and the conſequent deviation of the pendulum from that direction in which otherwiſe it would hang. And the ſame muſt be obvious with reſpect to motives and actions. Such inſtances are not to be regarded as examples of the ſeparation of cauſe and effect, motive and action; but they ſhew the neceſſity of conſidering thoſe caſes only in which the effect or action is ſo great, and of ſuch a kind, as to be eaſily perceivable, and in which the cauſes or motives reſpectively bear a conſiderable proportion to one another.

We muſt be cautious likewiſe not to confound the motive or principle of action, ſuch as an appetite, paſſion, or deſire, with that which is the object of ſuch ſentiments. In certain circumſtances of mind and body, all the Beauties of Mahomet's paradiſe, and all the luxuries of Cæſar's triumphal ſupper, would have no charms, and would be no temptation, even to the

greateſt voluptuary, to whom at other times the charms of beauty, or even the groſſer pleaſures of the table, would be moſt effectual motives. And in ſome caſes the offer of a ſhilling, of a loaf of bread, or of a draught of water, might juſtly be regarded as conſtituting a powerful, perhaps an irreſiſtible motive. But the very exiſtence of the motive, in ſuch caſes, depends on the poverty, the hunger, or the thirſt, of the perſon to whom the offers are made; without which the things offered, far from being deſirable, might be objects of contempt or diſguſt.

Such caſes cannot in reaſon or candour be regarded as inſtances of the ſeparation of motive and action; nor muſt we ever conceive a motive to ſubſiſt, but where there is in the perſon ſome tendency or diſpoſition to act according to it.

The ſame muſt be underſtood of phyſical cauſes. No ſubſtance is of itſelf a phyſical cauſe: this depends on its relation to ſome other ſubſtance, and implies the tendency to change in the latter. A magnet

magnet not attracting particles of gold, or of wood, as it does thoſe of iron; ſilver not diſſolving in water, as ſalt does; ſalt not diſſolving in water cooled to a certain degree; a magnetical bar ſometimes attracting, ſometimes repelling, the ſame end of another magnetical bar, according as the *poles* of one of them are changed; are not inſtances of cauſes ſeparated from their effects, but only proofs that the principle of change to which the phænomena in phyſics are referred, is not a quality of any ſubſtance, but a relation among different ſubſtances. The ſubſtance in which the change is obſerved is conſidered as the ſubject, the other as the cauſe; and as change occurs generally (I ſuſpect indeed univerſally) in both or all of the ſubſtances ſo related, though it be not always of the ſame kind in them all, it depends on the circumſtance of our attention being directed, firſt and chiefly, to one or other of them, and on our opportunities of obſerving the changes that occur in them, which of them we ſhall regard as the ſubject, which as the cauſe; as in the examples of the communication

not under the influence of any other cauſe, and unſupported.——If any body known to be heavy, ſuch as a ſtone, in the circumſtances now ſtated, and near the earth, were to remain at reſt, inſtead of falling, we ſhould regard the caſe as a miracle, and impute it either to the immediate *agency* of the Supreme Being, or to the *agency* of ſome other inviſible Being, having power to counteract its gravitation to the earth. But ſuch a miraculous operation of an inviſible agent would no more conſtitute a ſeparation of phyſical cauſe and effect, than the interpoſition of a viſible agent, ſuch as a living perſon, who ſhould ſupport the ſtone with his hand, would do.——In either caſe, there would be, or at leaſt there would be ſuppoſed to be, the oppoſition of one principle of change, to wit, an agent, to another, to wit, a phyſical cauſe; but by no means any alteration in the nature of the latter.

Laſtly, it muſt be obſerved, that in the notion of conſtant conjunction of cauſe with effect, motive with action, there is equally implied the impoſſibility of there ever

ever being a cauſe applied without being followed by effect, or a change (commonly regarded as an effect) taking place without being preceded by a cauſe; and a motive being applied without being followed by action, or an action being done without any motive. The former point is a fundamental, and I believe a juſt, principle in phyſics; the latter is the fundamental principle and eſſence of the philoſophical doctrine of Neceſſity, which I am here conſidering. And whatever may be thought of the truth of the principle with reſpect to motives and actions, it muſt at leaſt be evident, that an action being done without a motive, and a motive being applied without any action following upon it, would equally be inſtances of the ſeparation of them, and equally repugnant to the principle of their conſtant conjunction.

Yet, after all theſe allowances and explanations, all of which we may reaſonably ſuppoſe to have been thought of by Mr HUME, when he firſt laid down the doctrine, and introduced the phraſe, of

Conſtant

Conſtant conjunction, and by Dr PRIESTLY, and others who have adopted them, the inferences ſtrictly deducible from that principle are ſo palpably and ridiculouſly falſe, and ſo inconſiſtent with the common notion of motive, that I fear it will be thought improper, and almoſt uncandid, ſeriouſly to impute that principle to them, and to ſuppoſe them to have meant literally what they have aſſerted ſo expreſsly; as it appears ſcarce credible that they ſhould not have known, that in numberleſs familiar inſtances, there is a complete ſeparation of motive and action, while in the parallel examples in phyſics there is no ſuch ſeparation of cauſe and effect. Yet it would be unreaſonable to ſuppoſe them deliberately to have ſaid what they did not mean, nay almoſt the reverſe of what they meant, and to have called that a conſtant conjunction which they conceived to be only occaſional and ſeparable, and where the things ſometimes conjoined are much oftener completely ſeparated. Mr HUME's expreſſion, however, is preciſe; and he conſtantly maintains the perfect analogy or identity of the relation

of

of motive with that of phyſical cauſe, in all the caſes to which he ſeems to have attended.

If one Scotchman may preſume to judge of the Engliſh ſtyle of another, I ſhould not ſcruple to ſay, that Mr HUME underſtood and wrote Engliſh abundantly well to have been able to expreſs himſelf juſtly on this point, had he conceived juſtly concerning the two relations in queſtion. Then Dr PRIESTLY, who has acquieſced in Mr HUME's obſervations and reaſonings on this ſubject, and even adopted his phraſeology, is not only a native Engliſhman, but alſo a profeſſed philologiſt, and the author of an Engliſh grammar, and a moſt experienced writer, both on phyſical and metaphyſical ſubjects. It would be ſtrange, indeed, if an inaccuracy of expreſſion, ſuch as I allude to, conveying a meaning quite different from what was intended and illuſtrated by many examples, ſhould have eſcaped his obſervation.

Still, however, I own I ſhould not have ventured

ventured to regard the doctrine of the conſtant conjunction of motive and action as ſeriouſly maintained by any men of ſcience, were it not for the following conſideration, which with me is deciſive: There can be no doubt, that many men of diſtinguiſhed talents and eminence in ſcience, and among the reſt Mr HUME and Dr PRIESTLY, have ſeriouſly maintained the neceſſity of human actions, as proceeding from, or referable to motives, without any ſelf-governing power in a perſon. Now, this being ſuppoſed to be the caſe, the relation of motive and action, it is plain, *muſt* be either a conſtant conjunction, or not a conſtant conjunction; that is, an occaſional and ſeparable one. But I find, on tracing them carefully, that the neceſſary conſequences of both theſe ſuppoſitions are equally falſe, equally ridiculous, and equally inconſiſtent with the common notion of motive. Thoſe who deny the ſelf-governing power in perſons, *may* chooſe which of thoſe ſuppoſitions they pleaſe; but they *muſt* take one of them, with all its conſequences, however ridiculous, or however inconſiſtent with

the common notion of motive theſe may be. And it is ſurely the moſt candid and civil way of proceeding, to ſuppoſe them to have meant and believed what they have plainly and ſtrongly aſſerted.

But this diſcuſſion relates merely to the civility and decorum due to individual authors, to whoſe ſentiments I ſhould be ſorry to do any injuſtice. The method I take, I own, is rigorous; but it is not uncandid; and in this caſe it appears to be neceſſary. At any rate, with a view to the deciſion of the general queſtion concerning the nature of the relation of motive, and its difference from that of phyſical cauſe, it is of no conſequence whether the ſuppoſition of conſtant conjunction ever was ſeriouſly maintained by any author or not. It would ſtill be reaſonable and proper to ſtate and conſider it as one of the two poſſible ſuppoſitions with reſpect to the relation of motive and action, and to trace its conſequences rigorouſly, in order to find whether it were true or falſe.

With

With reſpect to the term *Power*, which already has been, and again muſt be, ſo often employed in this Eſſay, it will probably be thought peculiarly neceſſary to give ſome explanation of it; as Mr HUME has expreſsly maintained, and, by a number of very ingenious and elaborate arguments, has proved to his own ſatisfaction, and that of many other perſons, that we have no *idea* (or notion) of power; and that there are no means by which it is poſſible for us to acquire ſuch an *idea*.

The complete inveſtigation of the notion of power, of the various notions occaſionally expreſſed by this term, and of its metaphorical and ambiguous application in many caſes, and a rigid examination of Mr HUME's doctrine with reſpect to it, would require, and would deſerve, a pretty long Eſſay, and cannot with propriety be introduced in this place; but ſhall be undertaken afterwards. In the mean time, the following obſervations will, I hope, be ſufficient for the immediate purpoſe of preventing any obſcurity or

ambiguity in the uſe of the term; eſpecially if it be conſidered, that this Eſſay itſelf is in a peculiar manner ſubſervient to the inveſtigation of the notion and the real nature of power, by the collection and compariſon which it requires of many inſtances of the preſence and the exertion of power on the one hand, and of the want of it on the other.

From the uſe of the term *Power*, or of correſponding words in different languages, it is at leaſt to be preſumed, that mankind underſtand ſomething by it, that is, that they expreſs by it ſome notion or *idea*, however acquired. For my own part, I conceive this to be a neceſſary truth, of which we may be as certain as of any in geometry.

As men underſtand one another tolerably well when they uſe the term *Power* in their converſation and writing, we may be ſure that the notion underſtood and denoted by it is either preciſely or very nearly the ſame among them all.

The

The term *Power* is frequently uſed in very different meanings, that is, to denote different notions. For example, we ſay, A man has the power of ſpeaking; The King has the power of diſſolving his Parliament; Heat has the power of melting ice; A ſtream of air is the power in ſome machines, and the expanſion of ſteam in others; A lever is an uſeful mechanic power; The ſecond power of the number 8 is equal to the third power of the number 4.

As men do not confound thoſe different notions expreſſed occaſionally by the term *Power*, (ſo far at leaſt as to fall into croſs purpoſes in their converſation, or into any blunders in their conduct, whatever a few of them may have done in their reaſonings), it is to be preſumed, that the different meanings of the term are ſufficiently explained or underſtood by them from the things to which it is applied.

It is to be preſumed, that they have found or fancied ſome reſemblance or analogy among all the things or notions to which

which the term *Power* is applied; and that it is employed literally and ſtrictly to denote ſome of them, and metaphorically to denote others.

The moſt ſtrict and literal meaning of it appears to be an abſtract notion, bearing the ſame relation to the verb *Poſſum*, which the notion of exiſtence does to *ſum*. Exiſtence is the predicament of *being*; power is the predicament of *being able*. *Poſſum* is compounded of *potis* and *ſum*, ſignifying *to be able*; which circumlocution is employed to ſupply the defects of our Engliſh verb *can*, which correſponds to *poſſum*. The term *Power* is derived from the French verb *pouvoir*, correſponding to *poſſum* and *can*, and ultimately is derived from *poſſum* itſelf. To have power, and, To be able, are ſynonymous and convertible phraſes; like, to be, and, to have exiſtence; to live, to be alive, to have life.

It is in this its ſtrict and literal meaning that it is uſed in the two firſt inſtances that have been given. But there is

ſome

ſome difference between the notion of power in the two caſes: in the one it is more immediately, in the other more remotely, connected with its object or act; in the one, too, the connection is made partly by the relation of cauſe and effect, in the other it is made partly by that of motive and action.

It is in the literal, but general ſenſe now mentioned, that I employ the term *Power* in this Eſſay.

The notion of power involves ſome other notions or things to which it bears relation, and without which it can no more be conceived, than motion can be conceived without relation to time or ſpace.

Firſt, It involves the notion of a Being that has power: it is an attribute, not a ſubſtance; and cannot be conceived, but as inhering in, or belonging to, or predicated of, ſome ſubſtance.

Secondly, It involves the notion of intelligence or thought: there is ſomething optional

tional or diſcretionary in power: the ſubſtance or Being having power muſt therefore be *mind*.

Thirdly, It involves the notion of voluntary agency; nor can it be conceived without relation to action. Power to do nothing, is no power: power is the being able to do ſomething: there can be no voluntary action without an exertion of power; nor any exertion of power without ſome voluntary action. A Being that exerts power is termed an *Agent*.

Every perſon muſt judge for himſelf, whether he has a notion of power correſponding to what is implied in theſe illuſtrations, and whether he can diſtinguiſh it clearly and uniformly from the notion of neceſſary connection, and from that of conſtant conjunction, with both of which Mr HUME ſeems to confound it in his Eſſay. For my own part, I am very ſure I have ſuch a notion, and can as eaſily diſtinguiſh it from thoſe two, or from any other, as I can the notions of exiſtence, thought, or time; though I cannot undertake

take to define any of them in a ſatisfactory manner.

If any perſon ſhould not have, nor by any attention to the proper inſtances be able to acquire, ſuch a notion, he ought not to attempt to reaſon on ſuch ſubjects; he can never be any judge of them, nor even underſtand them. Nor can he, without abſurdity, pretend either to give or to refuſe his aſſent to any propoſition that involves the term *Power*, either as its ſubject or its predicate. Every ſuch ſentence would be to him as incomprehenſible as thoſe of an unknown language; with the additional diſadvantage, that it could never be explained to him.

I have occaſion often to conſider the ſuppoſed want of any ſuch attribute of mind, as this is the fundamental principle of the doctrine of Neceſſity. And for the ſake of brevity, and the oppoſition to what has been often termed *Activity*, and *Force of Mind*, I call it the *Inertia of Mind*; limiting, however, the ſignification of the phraſe to denote merely the incapacity of

acting optionally or diſcretionally, without motives, or in oppoſition to all motives, or in any other way but juſt according to the motives applied; and expreſsly excluding from the meaning of the phraſe the circumſtance of *mind* remaining or perſevering in any ſtate into which it once gets, as *body* does in a ſtate, either of reſt or of uniform progreſſive rectilinear motion, into which it is once put. Such permanency of ſtate does not appear to be any part of the conſtitution of the human mind with reſpect to any of its operations. Senſation of every kind, memory, imagination, judgement, emotion, or paſſion, volition, and voluntary effort, all appear to be tranſient conditions, or attributes of mind; which of their own nature, independently of any cauſe applied, paſs away, or come to an end. And this I conceive to be one of the moſt general circumſtances of diſtinction between mere ſtate or condition, which is predicable of mind as well as body (as, for example, madneſs, idiotiſm, vivacity, dullneſs, peculiar genius, wiſdom, knowledge, virtue, vice,

vice) and thoſe things which are termed acts or operations of mind, or thought.

As I have occaſion often to employ in this Eſſay the terms *Mind* and *Body*, it is proper to mention, that they are always uſed in ſuch a way as to involve no hypotheſis concerning the nature of either, nor, I truſt, to lead to any kind of ambiguity. The terms in queſtion, or the correſponding words in different languages, having been very generally employed for ſome thouſands of years, both in ſcientific reſearches and in common diſcourſe; and having been the ſubjects of many definitions and reaſonings; one might naturally ſuppoſe, that the notions expreſſed by them muſt be fully aſcertained, univerſally known, and free from all ambiguity. But the hiſtory of ſcience, and the preſent ſtate of it, ſhew plainly that ſuch is not the caſe. At different times, and even in our own time, there have been ſome philoſophers who denied the exiſtence of body, and others who denied the exiſtence of mind, or of both; that is, who maintained, that there are not, or at leaſt that we have no reaſon

to believe that there are any ſuch Beings or ſubſtances as we have been accuſtomed to ſuppoſe, and to expreſs by thoſe words. And at preſent ſome authors may be found, who hold, that all thoſe modifications or operations of thought, ſuch as ſenſation, memory, will, &c. which we uſually refer to mind, are really attributes of body, only peculiarly modified or conſtituted, as we find it in the body of a living perſon; juſt as much as extenſion, figure, and impenetrability, are attributes of body in all its modifications: while, on the other hand, one author at leaſt may be found, who holds, that there is in every living perſon, and even in a vegetable, a plurality of minds, of different kinds or orders; nay, that there is a mind of a certain kind, in every particle of matter, which is the principle of motion, or of every change whatever in it; without the agency of which, motion could not begin, nor even continue in a body. Theſe ſpeculations and notions are too remote from the object of this Eſſay to require any diſcuſſion here.

The notions of mind and body which are

are moſt generally adopted, and to which my reaſonings refer, are, I own, far from being perfect or ſatisfactory; or even direct: they are merely relative.

We perceive numberleſs qualities in the objects around us; theſe we cannot conceive but as qualities, implying a ſubſtance to which they belong, or of which they are qualities. To this ſubſtance, unknown, or known only by implication, we give the names of *Matter* or *Body*.

We are conſcious of perceiving in various ways, and of remembering, thinking, willing, and many ſimilar operations or occurrences. Theſe we can only conceive as attributes of ſome Being or ſubſtance; and to this Being, unknown, or known only indirectly and by implication, we give the name of *Mind*.

The implication in both caſes, I conceive to be irreſiſtible, and the belief conſequent upon it a law of human thought, as indefeaſible as any axiom of geometry. But with reſpect to the nature of the two ſubſtances

ſubſtances of which we acquire ſuch imperfect and relative notions by their attributes, we are left very much in the dark. For aught that at firſt appears, both ſets of attributes might belong to the ſame ſubſtance.

But the infinite difference between the two ſets of attributes has led the wiſeſt and beſt men in all ages and nations to believe that the ſubſtances to which they belong muſt be eſſentially and completely different. And the univerſal and indefeaſible notions of permanent perſonal identity, while every particle of matter in the body is changed, and of the individuality and indiviſibility of a perſon or intelligent Being, though his body may eaſily be divided, give ſuch force to that perſuaſion, that were it not for ſome illuſtrious examples, I ſhould not believe it could ever be ſeriouſly denied.

But ſuppoſing the totally different nature of mind and body univerſally admitted, or fully eſtabliſhed, there might ſtill be ſome difficulty in the right application of

of the terms. The two ſubſtances are conceived to be united in the living perſon. But that is not all. Certain bodily organs are ſo immediately ſubſervient to the attributes or operations of mind, that it does not appear that theſe can be performed without them; or performed properly, unleſs the organs be in the proper condition. Thus the brain ſeems neceſſary for every operation of the human mind, thinking, memory, ſenſation, will, voluntary effort to motion: the eye ſeems neceſſary for ſeeing, the ear for hearing, the muſcles for the voluntary effort. Certain it is, that we have never met with any inſtances of men making an effort to motion without muſcles, ſeeing without eyes, or thinking without brains; and we every day meet with inſtances of men, who, in conſequence of diſorders in their brains, in their eyes, or in their muſcles, think, and ſee, and make efforts, very imperfectly.

Theſe things many phyſical inquirers have laid too great ſtreſs on: by giving their whole attention to the inſtruments employed,

employed, they have overlooked the agent who employs them, or have miſtaken the inſtrument for the agent, or confounded the two together.

Metaphyſicians, on the other hand, have in general fallen into the very oppoſite error, and, by attending ſolely to the agent, have overlooked the ſhare which the inſtruments had in thoſe operations. Hence the ſuppoſition, that the mind, apart from all bodily organs, might have every faculty in higher perfection than we *find* them; and might be all eye, all ear, all intelligence, all activity. Now, though this be conceivable, it is in the higheſt degree improbable, as it is contrary to the analogy of every fact with which we are acquainted concerning the operations of mind.

Mind, therefore, ſeparate from all bodily organs, might not, and probably would not, be by any means that kind of Being which I have occaſion to reaſon about, and to compare with body, in order to obſerve

obſerve the difference between the relation of motive and that of phyſical cauſe.

Another circumſtance of ambiguity in the uſe of the term *Mind*, might ariſe from the conſideration of that term ſignifying a Being having certain attributes, and known only by them; which attributes are by no means inſeparably connected. A perſon may live after loſing one or more of his ſenſes, after loſing his memory, after loſing the power of voluntary motion, and perhaps even of the voluntary effort, after loſing all ſelf-governing power; nay, after loſing every kind of intelligence or thought. Such a Being plainly would not be the object of my inveſtigation; and it might be a matter of endleſs controverſy, to ſettle what or how many of the attributes of mind ſhould intitle a Being to be called *Mind*.

As that is not the object of my inveſtigation, I think it of conſequence to avoid ſuch controverſies and ambiguities; and this I think cannot be better done than by ſpecifying proper examples of the Beings

that are to be compared together, as inſtances of mind under the influence of motives, and of body under the influence of phyſical cauſes.

As the beſt inſtance of *mind*, I take a living perſon, in the full uſe of all the common human faculties: As an inſtance of *body*, any thing conceived to be lifeleſs; ſuch as a dead carcaſe, a ſtone, a ſhip, the earth, or the moon.

However philoſophers may have differed about mind and body, I believe none of them have ever doubted that there is an infinite difference between a living man and a dead carcaſe; and that the former is, and the latter is not, ſenſible to motives, and poſſeſſed of intelligence; and that the latter, as well as the former, is ſubject to the influence of phyſical cauſes. It is of no moment in this inquiry, whether we ſay, that in the living perſon there is a mind united with a body, or call the living perſon a *Mind*. The nature of the things to be reaſoned about is ſtill the ſame.

Nor

Nor muſt it be forgotten, that the circumſtance of the full uſe of the common human faculties is of conſequence. In the ſtate of ſleep, of drunkenneſs, of delirium, of madneſs, the ſelf-governing power, like all the mental faculties, may be in very different degrees or conditions from what we find it in the living perſon when awake, and in the perfect ſtate. It may be in very different degrees in the inferior animals, who, we conceive, have *minds*, though of a lower order than our own. And to theſe varieties it may be proper occaſionally to refer for illuſtrations of the nature and degrees of the ſelf-governing power, when once the reality of ſuch a power is proved.

SECT. V.

Explanation of the Algebraical Characters and Symbols employed in this Eſſay.

AS the application which I propoſe to make of mathematical reaſoning, and of algebraical notation, in this Eſſay, is new; and as I have occaſion to expreſs algebraically certain relations which never were expreſſed in that way before, and therefore having no proper ſymbols to denote them, muſt now be expreſſed by new ſymbols contrived for the purpoſe; it is neceſſary to explain particularly in what ſenſe I employ all the different algebraical characters and ſymbols that I have occaſion to uſe.

1. I employ the initial letters of the alphabet, A, B, C, to denote in general the obvious effects and actions, by which the

the unknown cauſes and motives are indicated and meaſured.

2. To denote, in general, the unknown cauſes or motives, I employ the final letters of the alphabet, X, Y, Z, as is commonly done in algebra, in order to mark diſtinctly and conſtantly what are known and what are unknown quantities.

3. I employ the common algebraical ſymbol for equality, =, preciſely in its uſual acceptation.

4. To denote the conjunction or exact concurrence of cauſes or motives, and of effects or actions, reſpectively, that is, motives with motives, effects with effects, &c. I employ the common algebraical ſymbol for addition, +.

5. To denote the direct oppoſition of motives or cauſes, and of actions or effects, reſpectively, I employ the common algebraical ſymbol for ſubtraction, —. This uſe of both theſe laſt-mentioned ſymbols

ſymbols has long been common in phyſics.

6. To denote the combination of cauſes or motives, and of effects or actions, reſpectively, which neither exactly concur, nor yet directly oppoſe one another, which is a relation (ſo far as I know) not hitherto expreſſed in algebra, and therefore has no peculiar ſymbol to denote it, I am obliged to employ a new ſymbol; and I think there cannot be a more proper one for the purpoſe than an abridgement of the well-known diagram for NEWTON's firſt corollary from the three laws of motion; thus, ⌈⌉. It is well known to all who know any thing of ſcience, that this corollary is the baſis of a vaſt fabric of the moſt important phyſical knowledge, which all who underſtand it admit to be as firmly eſtabliſhed as the abſtract truths of pure geometry. And I think it may eaſily be ſhewn, that all of it depends on the juſt conception, and on the truth or reality, of that relation among cauſes and among effects, reſpectively, which I mean to expreſs by the ſymbol in queſtion; which relation,

lation, therefore, I conſider as one of the moſt important and moſt general notions in phyſics; and mean to inquire, whether it extend to the voluntary actions of men, as well as to the phænomena or changes in inanimate matter.

7. To denote the relation of *conſtant conjunction*, which ſeems to take place between cauſe and effect in phyſics, and which it is maintained by Mr HUME ſubſiſts alſo between motive and action, as this too is a relation not hitherto expreſſed in algebra, and therefore not provided with any peculiar ſymbol to expreſs it, I am obliged to employ another new ſymbol; and the one which I uſe is three little parallel lines; thus, ≡. I prefer this ſymbol to any other for this purpoſe, on account both of its ſtriking ſimilarity to the common algebraical ſymbol =, and its obvious difference from it, which will in ſome meaſure enable us to keep conſtantly in mind, both the great affinity and the great difference between this ſuppoſed relation of cauſe and effect, motive and action, and the familiar relation of equality,

ty, or correſpondence of quantities of the ſame kind.

It muſt be remembered always, that it is only among effects or actions, reſpectively, that are of the *ſame kind*, that ſuch relations as theſe now ſpecified can be ſuppoſed to ſubſiſt. But if the effects or actions be of the ſame kind, however different in kind the cauſes or motives of them may be, all thoſe relations (except the laſt, which is the ſuppoſed relation between motive and action, cauſe and effect, and which it muſt be obvious comprehends the circumſtance of quality or kind, as well as that of quantity or degree) may ſubſiſt between them. But if the effects or actions be not of the ſame kind, and if the cauſes or motives of them be applied at the ſame time to the ſame ſubject or perſon, then they *may*, and according to the doctrine of *conſtant conjunction* they *muſt*, take place at the ſame time, in the ſame ſubject or perſon, without in the leaſt interfering with one another. It is therefore to be underſtood, that effects and actions reſpectively, of the ſame kind only,

ly, are the ſubjects of the following reaſonings; thoſe of different kinds, which may take place at once in the ſame ſubject or perſon, without interfering with one another, plainly not admitting of thoſe relations that have been ſpecified and explained; and being manifeſtly as incommenſurable as lines, ſurfaces, and ſolids are with one another. As I have no occaſion to conſider the relation of ſimultaneous, but diſtinct, occurrence of effects and of actions reſpectively, that are of different kinds, and are incapable of being blended or compounded together, I think it unneceſſary to propoſe any ſymbol for expreſſing it algebraically; but this, if required, might eaſily be done.

SECT. VI.

Difference between the relation of Motive and Action and that of Cauſe and Effect in Phyſics, ſtated in the form of a Propoſition.—To be demonſtrated by an argument ad falſum *and* ad abſurdum.—*Dilemma.—The relation of Motive and Action muſt be either a conſtant conjunction, or not a conſtant conjunction.—General neceſſary conſequences of the notion of Conſtant Conjunction, expreſſed algebraically, and reduced to the form of Canons or Axioms.*

AFter ſo many preliminaries, it is time at laſt to ſtate the chief propoſition which I mean to prove with reſpect to the difference between the relation of motive and action and that of cauſe and effect in phyſics, and to proceed to the argument by which it may be demonſtrated.

PRO-

PROPOSITION.

There is in mind a certain independent ſelf-governing power, which there is not in body; in conſequence of which there is a great difference between the relation of motive and action and that of cauſe and effect in phyſics; and by means of which a perſon, in all common caſes, may, at his own diſcretion, act either according to or in oppoſition to any motive, or combination of motives, applied to him; while body, in all caſes, irreſiſtibly undergoes the change correſponding to the cauſe, or combination of cauſes, applied to it.

To demonſtrate this, I aſſume the direct contrary ſuppoſition with reſpect to mind, and ſuppoſe it to have no ſuch ſelf-governing power, any more than body has; and that all our volitions, determinations, and actions, come to paſs in conſequence of the motives applied to us, as irreſiſtibly on our part as the changes or effects in body do from the application of

phyſical cauſes; and trace the neceſſary conſequences of this ſuppoſed *inertia* of mind, and influence of motives, to concluſions that are either falſe or abſurd, in the following manner.

The relation of motive and action *muſt be* either a conſtant conjunction, as that of cauſe and effect in phyſics ſeems to be, or not a conſtant conjunction, that is, an occaſional and ſeparable conjunction.

If the relation of motive and action and that of cauſe and effect in phyſics be a conſtant conjunction, the moſt obvious and general neceſſary conſequences of it *muſt be* ſuch as may be expreſſed accurately by the following algebraical formulæ, or canons, of univerſal application.

$$X \equiv A.$$
$$Y \equiv B.$$
$$Z \equiv C.$$
$$X + Y \equiv A + B.$$
$$X - Y \equiv A - B.$$
$$X \curlywedge Y \equiv A \curlywedge B.$$

As

As this mode of expreſſion muſt be new to every perſon, it may be neceſſary to point out how the preceding formulæ are to be read. It is thus:

If a certain cauſe or motive X is conſtantly conjoined with a certain effect or action A, and if another cauſe or motive Y is conſtantly conjoined with a certain effect or action B, of the ſame kind with the action or effect A, and if no other cauſe or motive Z conſtantly conjoined with a certain effect or action C, of the ſame kind with A and B, interfere; then when X and Y are applied at the ſame time to the ſame ſubject or perſon, and directly concur, the effect or action conſequent upon them, or, in the language of the ſyſtem, conſtantly conjoined with them, *muſt be* A and B jointly, concurring or added together, and *more than* either of them ſingly, by the whole amount of the other: When X and Y directly oppoſe and counteract one another, the effect or action conſtantly conjoined with them *muſt be* A oppoſed and counteracted by B, and *leſs than* either of them ſingly by the whole amount

amount of the other: And when X and Y applied at the ſame time to the ſame ſubject or perſon, neither directly concur, nor yet directly oppoſe one another, they *muſt be* conſtantly conjoined with the effect or action A, combined with or modified by the effect or action B, and *different from* either A or B taken ſingly. And the difference between the reſult of ſuch a combination of cauſes or motives, and that reſult which would have taken place if only one of them had been applied, *muſt be* equal to the full effect of the other.

The peculiar advantage of theſe general algebraical expreſſions, or *formulæ*, which I ſhall frequently have occaſion to make uſe of, and refer to as a ſort of canons, is, that they are not only more diſtinct, accurate, and conciſe, but more comprehenſive, than expreſſions of the ſame thoughts or concluſions in common language could eaſily be made; and at the ſame time carry moſt diſtinctly their own evidence along with them. They are in truth, like other algebraical *formulæ*, a kind of diſtinct ſhort hand.

As

As this mode of expreſſion, and indeed of reaſoning, on ſuch a ſubject, cannot be familiar to every perſon, nor perhaps be apprehended at once, I take the liberty to point out, what otherwiſe it would be impertinence to point out to men of ſcience, that if $X - Y \equiv A$, then $Y \equiv B$ is ſeparated from its effect or action; which is contrary to the principle. And the ſame muſt be equally obvious with reſpect to the other two caſes, or canons, of $X + Y$ and $X \upharpoonleft Y$, if it be found or ſuppoſed, that they are $\equiv A$, inſtead of $\equiv A + B$, or $A \upharpoonleft B$.

This ſimple but comprehenſive mode of reaſoning, and the three canons which I have offered as the reſult of it, I wiſh to be carefully examined; for much depends upon them. If the reaſoning is found to be unſatisfactory, and the canons falſe, in ſhort, if any perſon of competent judgement can *bona fide* refuſe his aſſent to them, every argument founded upon them muſt of courſe go for nothing. But if the reaſoning is found to be juſt, and the three canons be admitted as neceſſary inferences from

from the principle of *inertia* in the ſubject or perſon, and of *conſtant conjunction* of cauſe and effect, motive and action, (which ſuppoſition of itſelf fully implies the *inertia* of the ſubject), then every inſtance of the exact concurrence, of the direct oppoſition, or of the combination, of cauſe and effect, or of motive and action, muſt be admitted to have neceſſarily the conſequence expreſſed in the correſponding canon; and to deny this, or to reaſon againſt it, or to endeavour to aſſign a reaſon why ſuch a reſult ſhould not take place in any particular caſe, muſt be an abſurdity. For thoſe three canons comprehend, and muſt apply to, every poſſible caſe of the application of cauſes or motives to the ſame ſubject or perſon at the ſame time, and that produce effects or actions of the ſame kind; which conſequently cannot take place ſeparately, or without interfering with one another. Nor can we conceive a fourth way in which cauſes or motives conſtantly conjoined with their effects or actions, and having effects or actions of the ſame kind, may be applied to a ſubject

ject or perſon, any more than we can conceive a fourth dimenſion of body.

Let it be obſerved too, that thoſe three canons are of the nature of axioms. They are ſelf-evident neceſſary truths, bearing that relation to the notion of conſtant conjunction, which the axioms of geometry bear to the notion of quantity; and if the former notion, as well as the latter, be admitted to be juſt, they are axioms to all intents and purpoſes.

SECT. VII.

Illuſtrations of the exact import of the reaſonings in the preceding ſection.—Inſtances of the truth of the inferences from the principle of Conſtant Conjunction in caſes of Cauſe and Effect in Phyſics; and of the plauſibility of them in many caſes of the relation of Motive and Action.

THough I regard the reaſoning in the preceding ſection as perfectly ſatisfactory and unqueſtionable; yet I am far from thinking that this ſuperſedes the neceſſity of illuſtrating it very fully: for though both the ſubject and the reaſoning be ſufficiently ſimple, yet it muſt be owned, that they are both very abſtruſe, and no common, and conſequently no eaſy, objects of attention. But I think they may be explained and illuſtrated by proper inſtances, in ſuch a manner, that a child of ten

ten years of age, of ordinary capacity, ſhall eaſily and fully underſtand them. Indeed little more is required to enable a perſon to underſtand them, than that he ſhould underſtand or ſhould be capable of learning arithmetical addition and ſubtraction.

It is plain, in the firſt place, that either cauſes or motives may be applied ſingly; and if the conjunction of cauſe and effect and that of motive and action be conſtant, every cauſe or motive ſingly applied will be followed by its proper effect or action.

Thus, a body will move from impulſe, melt with heat, or diſſolve in its proper *menſtruum*; and a man will eat becauſe he is hungry, drink becauſe he is thirſty, run away becauſe he is afraid, do kind actions from benevolence, and commit cruel and unjuſt actions from anger, malice, or rapacity. And this is expreſſed by the ſimple *formulæ* $X \equiv A$, $Y \equiv B$, &c.

In the ſecond place, it is equally plain, that different cauſes or motives may be conjoined, that is to ſay, may concur in producing one kind of effect, or in prompting to one kind of action; and a greater effect or action of that kind will be produced by ſuch a concurrence of cauſes or motives, than by any one of them ſingly applied.

Thus, a ſhip under ſail with a favourable wind, will move with a certain velocity; and with a greater, if at the ſame time ſhe is in a favourable current; and with a greater ſtill, if at the ſame time ſhe is taken in tow by a ſhip that ſails faſter than ſhe does; or if ſhe is impelled by the force of oars, when theſe can be uſed. And a man who will do a good deal from a ſenſe of duty, and more from duty and honour and intereſt conjoined, will do ſtill more when there is ſuperadded to theſe motives the terror of military diſcipline. This caſe of the application of cauſes or motives, and the neceſſary reſult of it, according to the principle aſſumed,

med, is expreſſed by the firſt canon, $X + Y \equiv A + B$.

In the third place, it muſt be evident, that either cauſes or motives may be directly oppoſed by other cauſes or other motives. If the oppoſite cauſes or motives are of unequal force or ſtrength, the more powerful will prevail.

Thus, a ſhip will advance againſt an adverſe current, if the velocity in one direction which ſhe acquires from the wind is greater than what ſhe would acquire in the oppoſite direction, from the current. And a ſoldier will face any danger in the way of his profeſſion, if his ſenſe of duty, of honour, of intereſt, or even his dread of puniſhment, are with him ſtronger motives than fear of the enemy; but he will run away, if this fear be the ſtronger motive.

If the oppoſite cauſes or motives are equal, then they will exactly balance each other, like equal weights in the oppoſite ſcales of a juſt balance; or like a ſhip under

der ſail with a velocity equal to that of an adverſe current, which in this caſe ſhe will juſt ſtem, ſo as to remain in the ſame place relatively to the ſhore; or like the aſs, in the well-known imaginary caſe of the two equal and ſimilar bundles of hay, placed at equal diſtances, one on each ſide of him. This caſe of the aſs appears to me (as I believe it has univerſally been thought) a very fair and explicit one; and I wiſh it to be carefully attended to, as I mean to make an important uſe of it: for though it cannot reaſonably be ſaid to contain either truth or ſenſe, yet it undoubtedly contains the means of getting at truth, and of detecting nonſenſe. But of this afterwards.

The mutual deſtruction or prevention of the effects of equal and oppoſite cauſes or motives, is as obviouſly and neceſſarily implied in the notion of *conſtant conjunction*, as the principles of addition and ſubtraction are in the notion of number. And to ſet about proving, that when 10 is deducted from 10, there muſt remain nothing, or that $A + B - A = B$, or that

a

a juſt balance, with 10 pound weight in each ſcale, muſt remain even, or that a ſhip will not advance againſt a current which ſets her back as faſt as the wind ſets her forward, would moſt deſervedly be regarded as arrant trifling: they are all ſuch things as no perſon of ſound judgement ever doubted, or can be ſuppoſed to doubt of. But it muſt be obſerved, that our belief of ſuch of them as relate to phyſics depends entirely on our conviction, or, more properly ſpeaking, on our uniform and natural conception, of the abſolute incapacity of a body to move itſelf, and of the conſtant conjunction of cauſe and effect. For if either or both of theſe things were otherwiſe, the concluſions reſpecting the ſhip and the balance would often be found falſe upon trial; nor would they even be expected or ſuppoſed, *a priori*, to be true. The ſhip might be expected to go, and in fact would go, ſometimes with the wind, ſometimes with the current, according as the one or other of them was ſeparated from its proper effect on her ſails, or on her hull; and if the ſhip were not incapable

pable of moving herſelf, though neither the wind nor the current were ſeparated from their effects, ſhe might move in the direction of either of them, or in one perpendicular or oblique to both. And the correſponding concluſions with reſpect to the balance muſt be equally obvious. If the conjunction of cauſe and effect in the employment of that inſtrument were not conſtant, and the inſtrument abſolutely incapable of moving itſelf, we never could have any reaſon to rely on a balance as a juſt one.

The *inertia* of body, or its incapacity to move itſelf, or in any way to change its own condition, is implied in the notion of body, as completely as diviſibility is implied in the notion of time, ſpace, or number; or as the equality of the four ſides and angles is in the notion of a ſquare. A *Being* capable of moving itſelf, or in any way changing its own ſtate, is not what we call *Body*.

The fundamental principles of geometry are all neceſſary truths; the contrary of

of them, in every inſtance, being not merely falſe, but impoſſible and abſurd.

The principle of the conſtant conjunction of cauſe and effect, which is a fundamental principle in phyſics, may, for aught we know, be only a contingent truth; nay, it may be ſuppoſed no truth at all. A perſon may be conceived to doubt of it, till he can find ſome evidence of its truth. And, in fact, there are innumerable caſes, as, for example, the elective attractions in chemiſtry, which, on a ſuperficial view, might incline us to diſbelieve it; though, when ſtrictly examined, they all afford proof, or at leaſt additional inſtances of it. Yet it is very remarkable, that, notwithſtanding the vaſt number of inſtances ſeemingly in oppoſition to it, which even men of ſcience (as I have actually found) are ſometimes diſpoſed to inſiſt on, and the very ſmall proportion of mankind that can be ſuppoſed to have examined thoſe obſcure or doubtful caſes with ſuch accuracy as to diſcover the truth in them; yet few or none, even of the rudeſt and moſt ignorant of mankind, ſeem ever to have

doubted of the conſtancy of the conjunction of cauſe and effect, or would fail to regard any inſtance to the contrary as a miracle. This ſeems to indicate, that the conception of the relation of cauſe and effect, as well as the conviction of the neceſſity of a cauſe in certain caſes, depends not merely on obſervation and a ſort of rude induction, but on ſome fundamental principle of the human underſtanding. This perſuaſion muſt be conſidered more fully afterwards. But ſuppoſing it a truth, all the concluſions hitherto drawn from it are neceſſary conſequences of it: and as they are all found experimentally true as matters of fact, in innumerable inſtances, we have every reaſon, which the nature of the ſubject admits of, to believe, that the principle of conſtant conjunction of cauſe and effect in phyſics, whether it be a neceſſary or only a contingent truth, is at leaſt an eſtabliſhed law of Nature.

This caſe, of the application of cauſes or motives at once, which directly oppoſe one another, and the neceſſary reſult, according to the principles aſſumed, is expreſſed

preſſed by the ſecond canon, $X - Y \equiv A - B$.

Laſtly, It is plain, that various cauſes or various motives may be applied at once to the ſame ſubject or perſon, in ſuch a manner, that they ſhall neither concur exactly, nor yet directly oppoſe one another; and this without any regard to their being equal or unequal in force. This caſe we ſhall call, excluſively, the *combination* of cauſes or motives. Now, if it be true that bodies and perſons are equally incapable of moving themſelves, or of changing in any way their own ſtate; and that the relation both of cauſe and effect, and of motive and action, is a conſtant conjunction; then, in every ſuch caſe of a combination of cauſes or motives, there *muſt* be a correſponding combination in the effects or actions produced.

Thus, a ſhip ſailing in a current at right angles to her courſe, will advance in conſequence of the impulſe of the wind on her ſails; but at the ſame time will deviate from her courſe in conſequence of

the influence of the current on her hull. A ſhip, or indeed any *body*, in this or any ſimilar ſituation, will deſcribe the diagonal of a parallellogram, whereof it would have deſcribed one or other of the two contiguous ſides, if the cauſes of its motion had been applied ſingly; and it will deſcribe that diagonal in the ſame time that it would have deſcribed either of the contiguous ſides of the parallellogram ſeparately. And a body under the influence of what is called a *centripetal*, and a *projectile* or *tangential* force at the ſame time, will deſcribe a portion of ſome conic ſection in every moment that its motion continues. All theſe things are well known by experiment and obſervation as matters of fact: and, moreover, they are demonſtrated by Sir ISAAC NEWTON, in his *Principia*, as neceſſary truths.

In like manner, a perſon under the influence of different motives, which neither perfectly concur nor yet directly oppoſe one another, will act in a different manner from what he would have done if

if only one of the motives had been applied.

Thus, in the well-known ſtory of the Decemvir *Appius Claudius* and *Virginia*, we conceive, that a violent deſire to get poſſeſſion of the perſon of *Virginia*, more powerful than any conſiderations of virtue, prompted the Decemvir to endeavour to do ſo *per fas aut nefas*. If this motive had been applied ſingly, or oppoſed only by thoſe weaker motives which juſtice, humanity, or chaſtity ſuggeſted, we conceive, that it would have prompted him to employ direct and open violence, of which he had the means in his power, as the ſureſt and readieſt way to accompliſh his purpoſe. But then prudence, fear of the indignation of the Roman people, and perhaps ſome other leſs obvious motives, urged him to avoid giving any offence by an open and violent exerciſe of his power; and induced him to have recourſe to art and fraud, in order to gain his end with the appearance of law and juſtice. His conduct accordingly was the reſult of the mixture or combination of ſuch

ſuch different motives, and plainly different from what it would have been, or by any judicious perſon would have been expected to be, if only one of thoſe motives had been applied.

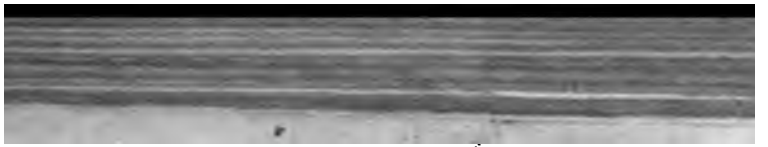
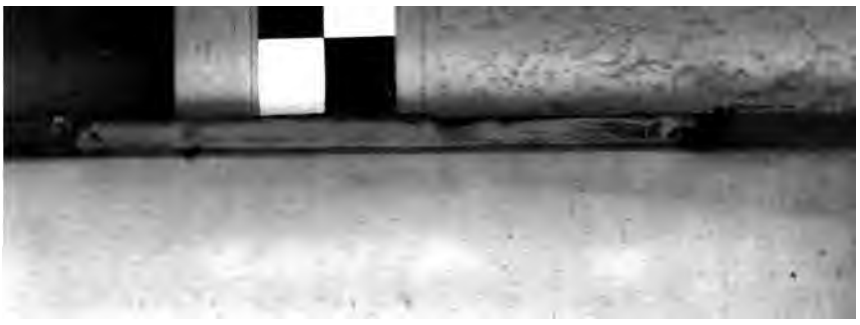
Every ſuch caſe of the combination of cauſes or motives, and the *neceſſary* reſult of it in effect or action, according to the principle aſſumed, is expreſſed by the third canon, $X \curlywedge Y \equiv A \curlywedge B$.

All the preceding inſtances of the relation of human actions to the motives of them, and of the analogy and reſemblance between the relation of motive and action and that of cauſe and effect in phyſics, I have expreſſed cautiouſly, and in thoſe vague, ambiguous, and hypothetical terms, which have been too generally employed on this ſubject, and have by many philoſophers been thought rational and ſatisfactory. They are all ſuch inſtances as I have occaſionally heard given as illuſtrations of the doctrine of Neceſſity, and as proofs of the cloſe and ſtriking affinity, or rather indeed of the perfect identity,

of

of the two relations in queſtion. Few people, I believe, will think them overſtrained, and fewer ſtill will ſuſpect, that, if taken literally as they are ſtated, they are all falſities, abſurdities, and little better than nonſenſe; which yet they certainly are.

For it muſt be obſerved, that on ſuch a point as this, it is not ſufficient to give a few inſtances, even though they were all accurately expreſſed, and undoubtedly true, as a proof of the principle in queſtion. For if *it* be true, then all thoſe general inferences from it, of which I have given only a few examples, will be neceſſarily and univerſally true in every particular inſtance. And if in any caſe it be found, that they are not true as matters of fact, when the proper experiment is fairly made, it muſt be admitted, that the principle of which they are neceſſary conſequences is falſe. For it may well happen, that the reſemblance between the two relations in queſtion ſhall be ſtriking, and pleaſing, and very generally obſervable; while yet the difference between them, though in many

many caſes obſcure, and in ſome hardly perceptible, may be real and highly important: And this I believe is actually the caſe. But it is one of the chief objects of ſcience in many caſes to diſcover ſuch differences among things, as the moſt effectual, or perhaps the only, means of extending our knowledge of them.

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